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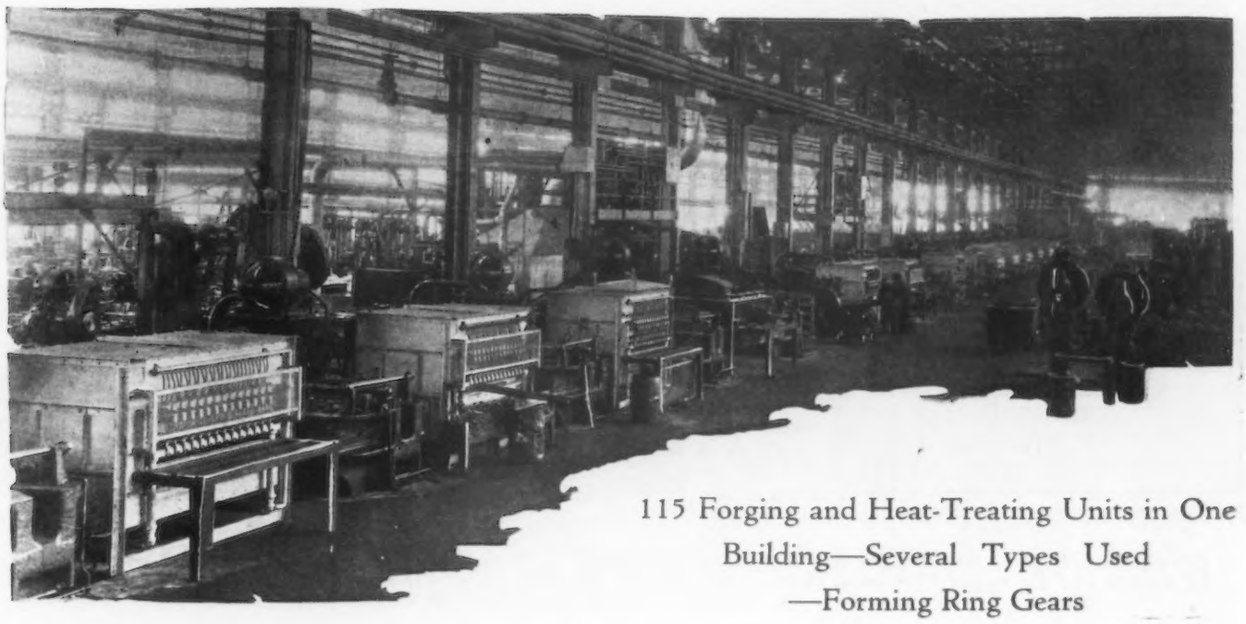
Ford Uses Many Electric Furnaces



115 Forging and Heat-Treating Units in One Building—Several Types Used —Forming Ring Gears

BY FAY LEONE FAUROTE*

PROBABLY the largest group of electric furnaces to be found in any one building in the world is in the Fordson plant of the Ford Motor Co. This big installation is in the spring and upset building. Here there are 115 electric furnaces using a total of about 20,000 kw. Seventy-six are operating in the spring department and 28 in the forging department, the remaining 11 being used on miscellaneous work.

Nickel-chromium in ribbon form is used as a resistor in those furnaces where the temperature does not exceed 1500 deg. Fahr. In some of the high-temperature furnaces troughs of carbide compound filled with pulverized carbon are used. Others are fitted with globar resistors, a non-metallic resistance element resembling silicon-carbide in appearance. Two of the furnaces use wire and one uses graphite for a heat source.

Alternating current is supplied at the building at 13,200 volts. From a substation it is carried to two distribution points, where it is transformed into 220 and 440 volts respectively. The 76 furnaces in the spring department are capable of handling 6000 rear springs and 12,000 front springs for the new Ford Model A, and 2500 springs for the truck, in two 8-hr. shifts. Two of the furnaces, on the eye operation, are equipped with transformers which permit the voltage to be increased when it is desired to accelerate heating the springs.

Ford engineers say that the metal resistor type of furnace is long lived, simple and efficient. The form of its resistor makes it an easy matter to locate the heat source in any part of the furnace, or to have varying degrees of temperature in different parts of the same furnace. Elements composed of lengths of nickel-chromium on frames of fused aluminum oxide and fire clay are installed in floor, walls or ceiling of a furnace, or in any two or three of these places if desired. Thus heat may be put exactly where needed. When a break-down occurs these resistors may be removed easily through panels in the furnace walls, and repairs made in a short time.

Ribbon resistor-type furnaces have been operated for as long as a year without any apparent change in the area of the cross-section of the resistor or other deterioration of its structure. Ribbons of various cross-sections are used, those of common size being 0.03 x 1½ in.; 0.08 x 1½ in.; 0.08 x 1¾ in.; ⅛ x 1¾ in., and 0.05 x 1¾ in. The usual combination alloy for temperatures up to 1900 deg. Fahr. is about 80 per cent nickel and 20 per cent chromium. In small laboratory furnaces the resistor is often in the form of a continuous wire.

The globar type of resistor is well regarded also, es-

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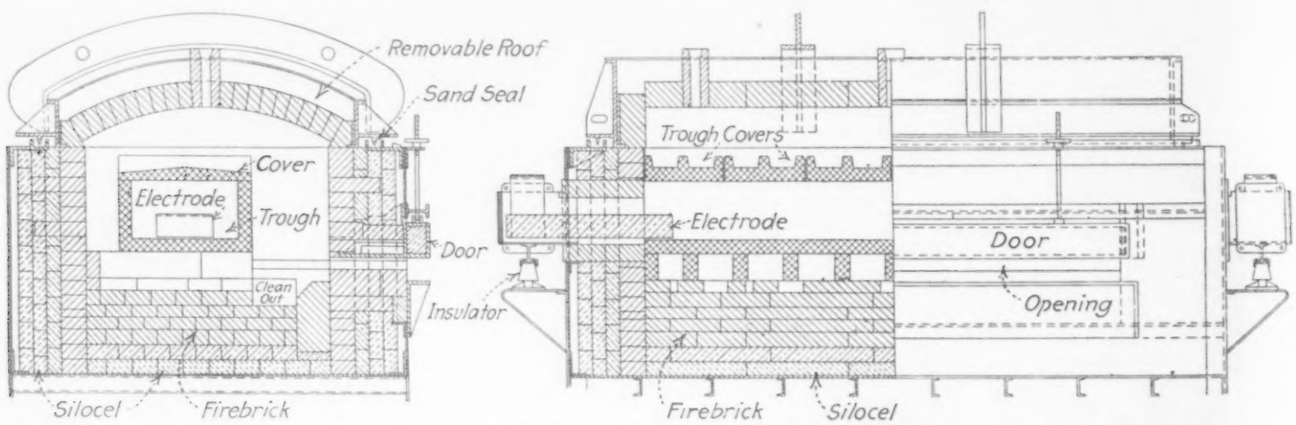
At head of page is general view of one group of the electric furnaces in the spring and upset building at the Fordson plant.

pecially for those furnaces that operate at higher temperatures than 1500 deg. Fahr. For forging furnaces, where temperatures range from 2300 to 2400 deg. Fahr., the globar units give excellent results. They have been known to last 1000 to 1200 hr. and with further development it is said 2500 hr. will be possible. They are economical, easy to introduce into the furnace, rigid, strong and not liable to deterioration. They may be used for lower temperatures also, and of course give satisfactory results. The Ford Motor Co. engineers began experiments with globar resistors in 1925, but it was not until 1926 that the results achieved seemed to warrant their continued use. Since then, however, this form of resistor has been steadily gaining in favor.

The operation of the spring-forming machinery is interesting. Spring steel stock cut to proper size is put on a conveyor and carried through the furnace, both ends of the stock being heated to a proper curling temperature meanwhile. Leaving the furnace they pass downward, are lifted off and inserted in a double press which curls both eyes at one operation. Each unit is capable of heating and curling eight spring leaves a minute or 3840 a day. These furnaces are rated at 170 kw. to 252 kw.

with a capacity to heat 2000 lb. of steel an hour to 2250 deg. Fahr. at a power consumption of not to exceed 400 kwhr. a ton, heating billets 2½ in. in diameter by 8½ in. long. This furnace is approximately 12 ft. long and 7 ft. wide, built of sheet steel, lined with 2 in. of Silocel powder, 4½ in. of Silocel brick, 2½ in. of C-22 insulation brick and 4¼ in. of high-grade fire brick. The furnace roof, of arched type, is removable, equipped with a sand seal, lined with 5 in. of insulation and 4½ in. of refractory brick. The heating elements consist of two covered troughs of silica-carbide containing granular graphite. These troughs, supported on piers, extend lengthwise of the furnace, having suitable power input connections at the ends. Stock to be heated is charged into the furnace through seven openings 12 in. square in the back of the furnace. Heated stock is removed from the front of the furnace through similar openings. All the openings are fitted with hand-operated, counterweighted doors, sealed at the top. The floor of the heating chamber is flat, with the bottom of the discharge opening at 3 ft. 6 in. above the floor line.

Electrical equipment for this furnace includes 225 kw. oil-cooled transformers with primary windings for 440-volt, 60-cycle alternating current, arranged for connection to



ELECTRIC Forging Furnace Having as its Heating Element a Trough of Carbide Compound Filled with Pulverized Carbon and Energized Through a 78-In. Space Between the Two Large Electrodes. This furnace was furnished by the Electric Furnace Co., Salem, Ohio

The 28 electric furnaces in the forging department operate at a temperature of 2350 deg. Fahr. and require a total of 7732 kw. Seventeen of these furnaces use globar resistors, 1¼ in. in diameter x 28 in. There are twenty-seven heating elements to the furnace. Total power per furnace: 337 kw. at 220 volts, three-phase, 60 cycles; of which 187 kw. is on No. 1 control and 150 kw. on the second.

These furnaces are approximately 8 ft. wide, 4 ft. deep and 6 ft. 5½ in. high and are lined with suitable insulation and refractory brick to provide a heating chamber 5 ft. 6 in. wide, 22 in. deep and 22½ in. high to top of arched roof. The whole is inclosed in a steel-plate shell, well braced and reinforced to prevent warping.

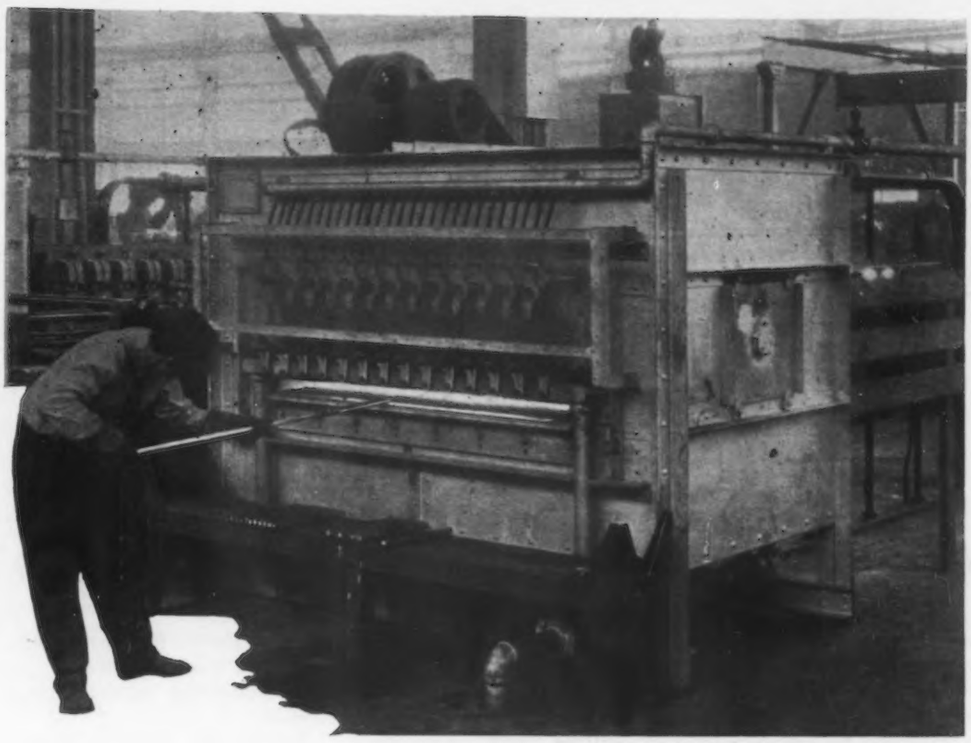
Stock to be heated is inserted through a slot adjustable for opening 1 in. to 4½ in. The globar elements, rated at 10 kw. each on a 110 to 120-volt power supply, are star-connected for operation on the 220-volt, three-phase 60-cycle alternating current supplied. They are controlled by Leeds & Northrup recording controllers. These forging furnaces are lined with fire brick, red Silocel and natural Silocel. The resistors are held at each end by water-cooled spring contacts, thus arranged for quick replacement. The furnaces can heat 1000 lb. of steel an hour to 2250 deg. Fahr., with a power consumption giving about 4¾ lb. heated per kwhr. on stock up to 2 in. in diameter.

A special 450-kw. trough resistor type furnace is designed to operate at a temperature of 2400 deg. Fahr. and three-phase power supply, with secondary wound with six taps for variable power supply to furnace. The switching and metering equipment consists of one 1000-amp. magnetically operated oil-break switch, for primary circuit for furnace temperature control through Leeds & Northrup recording controller, one 2000-amp. six-point hand-operated selective type oil-break switch for secondary circuit for varying power input to furnace, one indicating type watt-meter, one current transformer and the panel. There is also a relay for magnetic switch operations from Leeds & Northrup controller.

While the greatest number of electrical furnaces are to be found in the spring and upset building of the Fordson plant, there are other installations in the motors and rolling mill buildings.

Three of the 19 furnaces in the motors building are quench furnaces, 24 ft. long, rated at 237½ kw. These are used for hardening the Model A crankshafts. Each furnace here has a capacity of eighty-five crankshafts an hour. They operate at a temperature of 1500 deg. Fahr. To save floor space, the drawing furnaces are built on top of the quench furnaces. The shafts are carried up and through these furnaces on a conveyor, the drawing furnaces using 189 kw. and operating at 700 deg. Fahr.

Other electric furnaces in the motors building include one 82-kw. continuous furnace for hardening push rods, with a capacity of 4800 an hour, one 149-kw. continuous furnace for hardening piston pins, also having a capacity

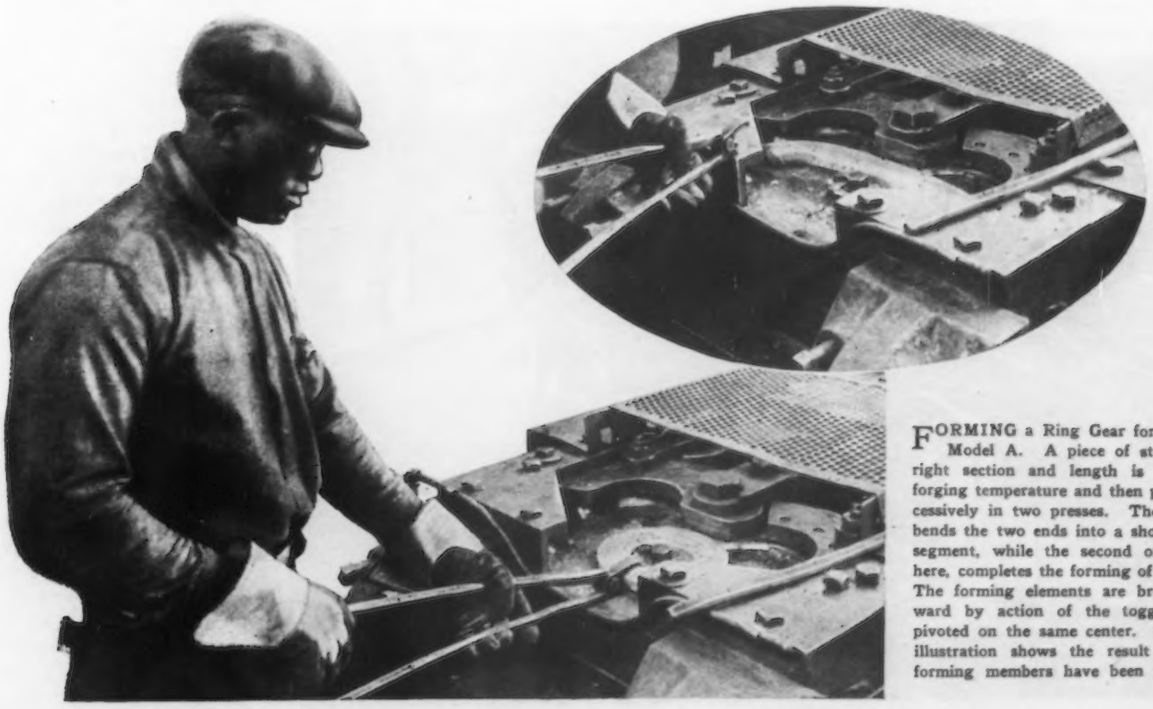


ELECTRIC Forging Furnace at the Ford Works. The height of opening for charging and withdrawing is adjustable to a maximum of 4½ in. The springs supporting the globar heating elements are back of the screen. A forging machine (behind the operator) is close alongside each furnace

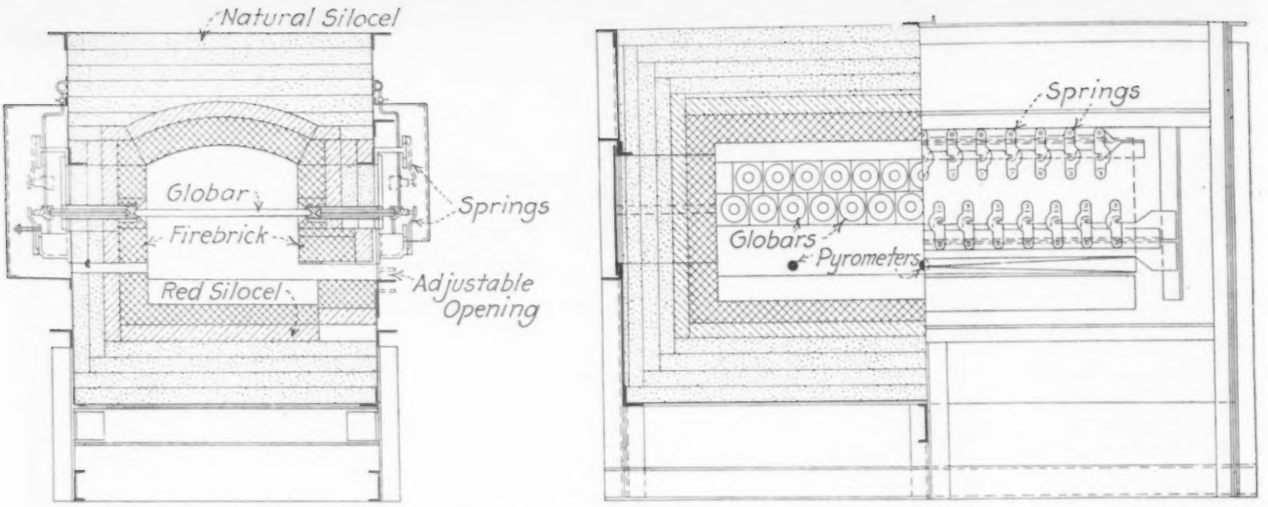
of 4800 an hour; two rotary furnaces, 116 kw., approximately 14 ft. in diameter, which are used for hardening camshafts and which have a capacity of 204 each hour; three continuous quench furnaces, 207 kw., operating at 1500 deg. Fahr., and three drawing furnaces, 199 kw., for heat treating connecting rods and with a capacity of 11,000 rods in 8 hr. Practically all gears are drawn in three continuous furnaces, each 42 ft. long.

In the rolling mill building are two electric continuous furnaces for heating bar steel for forming ring gears. These use 400 kw. and 300 kw. respectively, both operating at 2000 deg. Fahr. Six other forging furnaces, totaling about 2700 kw., and each operating at about 2350 deg. Fahr., and two continuous hardening furnaces of 300 kw. each, complete the present installation in the rolling mill building.

When electric power may be had at a low cost, such as 1c. a kwhr., the use of the electric furnace would seem to offer the solution of many of the troublesome problems arising in the forming and heat treatment of steel. In the main the advantages far outweigh the disadvantages. While the first cost of the installation, with its accompanying electrical control apparatus, is high, and the cost of energy per B. t. u. is high, these costs are more than balanced by other economies of operation and control. It is true that an electric furnace heats up slowly from atmos-



FORMING a Ring Gear for the Ford Model A. A piece of steel bar of right section and length is heated to forging temperature and then placed successively in two presses. The first one bends the two ends into a short circular segment, while the second one, shown here, completes the forming of the circle. The forming elements are brought forward by action of the toggles, being pivoted on the same center. The lower illustration shows the result after the forming members have been withdrawn



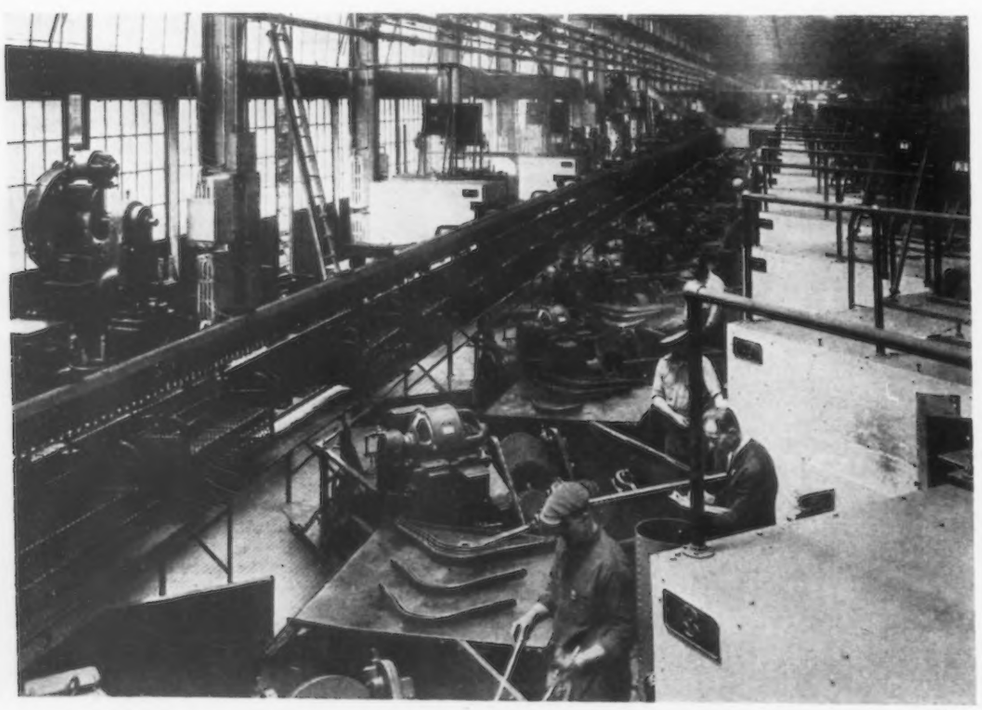
GENERAL Arrangement of a Globar Furnace, as Used in Forging Practice at the Fordson Works. Each globar element is supported at both ends by a fixture, water-cooled and held in place by springs. This is a Holcroft furnace, with several of its features developed by Ford engineers

pheric temperature at the start, but its close control afterward balances its account in this respect. Costs of repairs are apt to be high, too, but this condition may be ameliorated by avoiding delays and by making provision for quick replacement of resistors or other failing parts. Finally, there is likely to be some loss in case of intermittent operation.

On the other hand, in the operation of electric furnaces there is first of all a temperature regulation which is at once simple and sure. It is easily controlled automatically, and can be made to stay within very small variable limits. A recording controller makes hand operation or personal attention on the part of the workman or foreman unnecessary. The installation of an electric furnace is simple. It takes up little room. It is clean, both as to outside appearance and operation. The workman can stand near the opening in working position without discomfort. The outside heat is hardly noticeable, even in the hottest weather. Strange as it may seem, there is at times an actual necessity for closing the roof ventilators to prevent an excessive draft in the spring department, on some days when the wind is in the right direction to cause an excessive draft. The temperature in this furnace room in August is not excessive.

Incidentally, all Ford furnaces are painted with aluminum. The effect both in clean appearance and radiation is at once apparent. In the case of the electric furnace labor cost is at a minimum and a high quality of product is possible, for several reasons. There are no troublesome gases to deal with, no products of combustion in the furnace or escaping into the outside atmosphere of the shops. The space around and above the furnaces may be kept clean; there is little to cause dirt or dust. Electric furnaces may be moved easily, shifted about as work or process lines require. There is little additional equipment needed and most of it can be put on one panel; it is moved with the furnace and set up just as easily.

The stock can be kept clean, there is little tendency to scale, no opportunity for steel to absorb harmful ingredients, such as sulphur, while being heated. The tempera-



HEAT Treatment of Springs in the West Half of the Spring and Upset Building Is Accomplished in a Battery of Electric Furnaces. To conserve space, the drawing furnaces, which operate at a lower temperature, are located on top, as shown. The parts pass from the lower furnace to the one above by means of a conveyor system

ture can be maintained at the desired level and there is no possibility of burning the stock. The furnace can be put into operation at the throwing of a switch, and shut down in the same easy way. The life of the heating chambers is long, because there is no combustion taking place in them and hence no deterioration from gases or fumes.

The fact that there is available at Fordson 500,000 hp. made at low cost makes the use of electric furnaces for the purpose of heating steel for forging and hardening possible in a large degree. Yet it is beginning to be realized elsewhere that the advantages of electric heating are so many that even this element of power cost may not be so important as it seems. Certainly Henry Ford has shown his confidence in it, and the results seem to justify his judgment.

Automatic Control of Operations

Instruments Giving Both Records of Past Performance and Manipulation of Valves Under Pre-determined Conditions

USE of recording and controlling instruments in the iron and steel industry was reviewed by C. C. Eagle and Roy M. Walker, Bristol Co., Waterbury, Conn., at the Chicago meeting of the Association of Iron and Steel Electrical Engineers. They said that the increasing use of arc welding has created a demand for an instrument to record the cycle of operations and give a history of the work done by the welder. A recording shunt ammeter does this so well that it is regularly furnished with some welding machines. It gives a record of time worked by the welder, so that the faithful welder gets full credit for his work. The character of the curves shows the type of work. If a large stick or two sticks are used, instead of one, to rush the work, this is shown up by the excess current. Reversed polarity hastens the work and badly weakens the weld, and is unmistakably recorded on the chart. If an electrode is thrown on the ground and left there, the straight line curve shown on the chart indicates the grounding of the electrode. Reference to the chart is a help to the welder and enables the supervisor to correct irregularities.

Checking of operations on the reversing valves on open-hearth furnaces is considered of the greatest importance in most steel plants. It is essential that the reversing valve be thrown on schedule from one checker chamber to the other, so that each may be brought up to the proper temperature and fuel not wasted after the checker has absorbed this heat.

An effective way of checking this operation is to install an electric time recorder on the reversing valve. This time recorder has a pen operated by an electromagnet. This pen is wired to a contact on the reversing valve, so placed that, with the valve in one position, the circuit is open; with the valve in the other position, the circuit is closed. The pen moves over when the valve is in one position and moves back when the valve is reversed. The resulting record shows at a glance the exact time of each reversal.

In addition to this record for the superintendent, one plant uses a single-pen recorder at each valve to guide the operator and indicate to him how the furnace was running during the previous shift.

Automatic Control Eliminates Human Factor

Some tendency has been shown of late to do more than keep a record of the reversing valve operations. It has been felt that automatically controlling these operations, thus removing the human factor, would be a decided step forward and well worth some expenditure. This plan also takes into consideration the fact that the checker chamber at one end of the furnace frequently heats up more slowly than that at the opposite end.

A scheme of accomplishing this control has been worked out, using two pyrometer controllers. The location of the thermo-couple has been the greatest problem to consider here. Temperatures in the hot part of the checker work are so high as to require the use of platinum couples, resulting not only in great initial expense, but also in great care and upkeep of thermo-couples. It has been pretty definitely established that a cooler spot in the rear of the checker work can be located where the changes of temperature are directly proportional to those in the hot zone. This permits the use of base metal couples and results in comparatively little upkeep.

Once this cool spot has been located, and the temperature there corresponding to the maximum temperature desired in the checker work determined, the rest is a simple procedure. A thermo-couple is located in each checker chamber and each couple connected to a pyrometer controller. The spotter on each controller is set at the temperature corresponding to the maximum temperature desired. The two controllers are then wired to the motor at the reversing valve. As soon as checker chamber *A* reaches the desired temperature a contact is closed in controller *a*, which starts the motor of the reversing valve, throwing it over to chamber *B*. Then, as soon as *B* reaches the desired temperature, a contact is closed in controller *b*, and the valve is thrown back to *A*. By means of an automatic reversing switch from the thermo-couples, one controller only will do this work.

Reversing Valves by Temperature Differential

A successful installation has been made to control the reversal of valves by differential temperature. By connecting the two thermo-couples in series, and opposed to each other, the control instrument is operated by the difference in the temperatures in the two checker chambers.

Some open-hearth departments have found it highly desirable to keep a daily check of temperatures in different parts of the checker work. This gives a valuable line on stoppages from dirt, soot, etc. For this work a portable indicating pyrometer is used. The usual range is 0 to 2500 deg. Fahr., using a base thermo-couple with a nichrome or some other high-temperature metallic protection well.

In a warehouse where sheets are stored, considerable expense is caused by the rusting of the sheets, including those in the center of a pile. This condition may be guarded against by reference to a recording psychrometer. This recorder is supplied with a small motor and fan to assure circulation of air over the wet bulb. The range of about 30 to 110 deg. Fahr. is satisfactory. If the record shows the atmospheric condition when dew will form, fans are started to circulate warm air throughout the warehouse, to prevent moisture collecting on the sheets.

To get the best possible efficiency from an instrument it must be selected with the right thermo-couple or bulb, the right length of lead, and the right range. Accuracy of the readings, under the severe operating conditions usually encountered in a steel mill, is the prime requisite. Then models are selected with protection cases suitable for the surroundings. Heavy cast iron cases, out of place on a fine switchboard, are ideal in a room filled with gas or acid fumes.

New Products from an Old Iron

TRANSFORMATION of a gray iron foundry, the principal product of which was brake shoes, into a manganese steel and gray iron production shop has been successfully undertaken by the American Manganese Steel Co., Chicago. This company purchased the Burnside, Ill., plant of the American Brake Shoe & Foundry Co., which consisted of seven and one-half acres of ground, improved with modern foundry buildings housing two cupolas, and a raw material storage yard served by a gantry crane. New equipment installed includes a 1½-ton per hour electric furnace, an annealing furnace, a core baking oven, new sand-handling and preparing equipment, and miscellaneous items, such as a 500-ton press used for straightening frogs.

The two cupolas (Whiting No. 7 and No. 8) were allowed to remain in their former location, which is on the west side of the main building and easily accessible to the storage yard and the material-handling and charging equipment. These units are available for use in supplying gray iron castings to the jobbing trade. The electric furnace is located in the northwest corner of this building, not far from the cupolas and close to the material yard, which extends parallel to the main building. Beneath the gantry crane is an industrial track, from which spurs extend at frequent intervals into the main building.

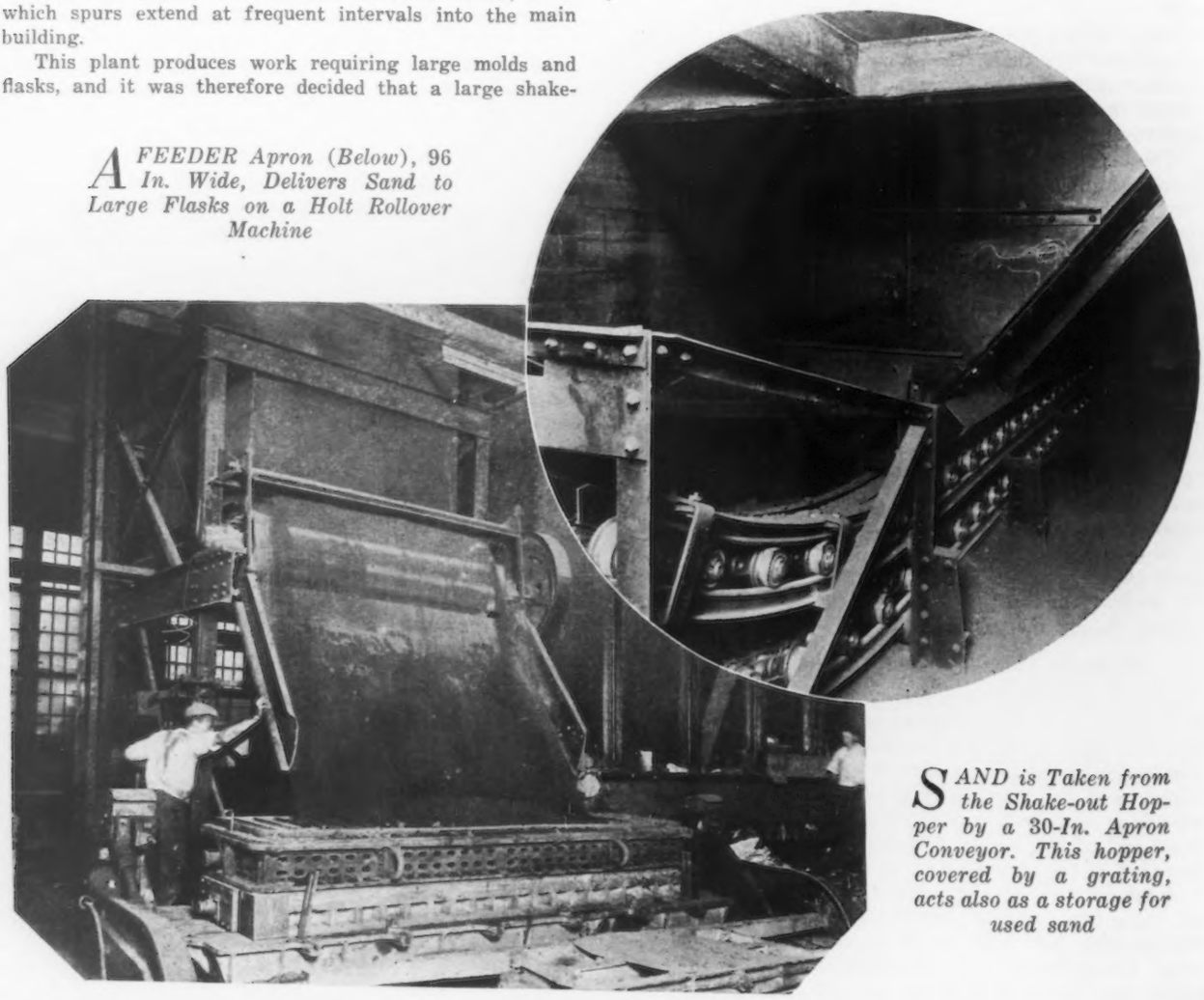
This plant produces work requiring large molds and flasks, and it was therefore decided that a large shake-out hopper would serve two purposes: first, that of providing shake-out floor area for the large molds and, second, a storage or reservoir for the shake-out sand. This hopper is 16 x 20 ft. in area, and the top, which is covered with bar grating through which the sand drops, is set level with the floor.

Used sand is fed through the bottom of this shake-out bin to an apron conveyor, at the head of which is placed a short-center magnetic separator belt for removal of scrap, gaggers, etc., before delivery to the bucket elevator. Scrap is removed through a trap door and is then loaded in boxes, which are carried away by an overhead crane.

From the magnetic separator the sand is elevated by a 7 x 12-in. bucket elevator to a tapered, hexagonal revolving screen, which acts as a breaker of lumps and also screens and removes refuse. This screen is housed in a steel box to which is attached a suction line and dust collector for the removal of dust and fines from the sand.

From the screen the sand is delivered to a belt conveyor, at the head end of which a two-way spout is arranged for diverting the sand to the facing-sand mill. If backing sand is being prepared, water is added in proper quantity by a spray pipe, which extends across

A FEEDER Apron (Below), 96 In. Wide, Delivers Sand to Large Flasks on a Holt Rollover Machine



SAND is Taken from the Shake-out Hopper by a 30-In. Apron Conveyor. This hopper, covered by a grating, acts also as a storage for used sand

Foundry

Modern Equipment Transforms Chicago Plant So That Electric Manganese Steel Castings Can Be Made—Sand Handling and Annealing Furnace Features

the bed of sand passing on the belt conveyor. The sand is then discharged to a double paddle mixer or pug mill, which mixes and reconditions it. Backing sand is handled by a short cross-belt conveyor and a long distributing belt conveyor operating alongside the columns in the main foundry bay. By means of adjustable plows, this sand may be discharged at any point to shoveling hoppers for floor molding purposes.

If old sand is required for preparation as facing, the water spray is shut off and the sand is diverted to a hopper which was erected over a No. 3 Simpson mill, located in a side room just off the main foundry. This hopper has two compartments, one fed with old sand by means of the belt conveyor described above, and the other receiving new sand from the storage by means of the crane and grab bucket. Facing sand is distributed from the mill throughout the foundry by boxes mounted on electric lift trucks.

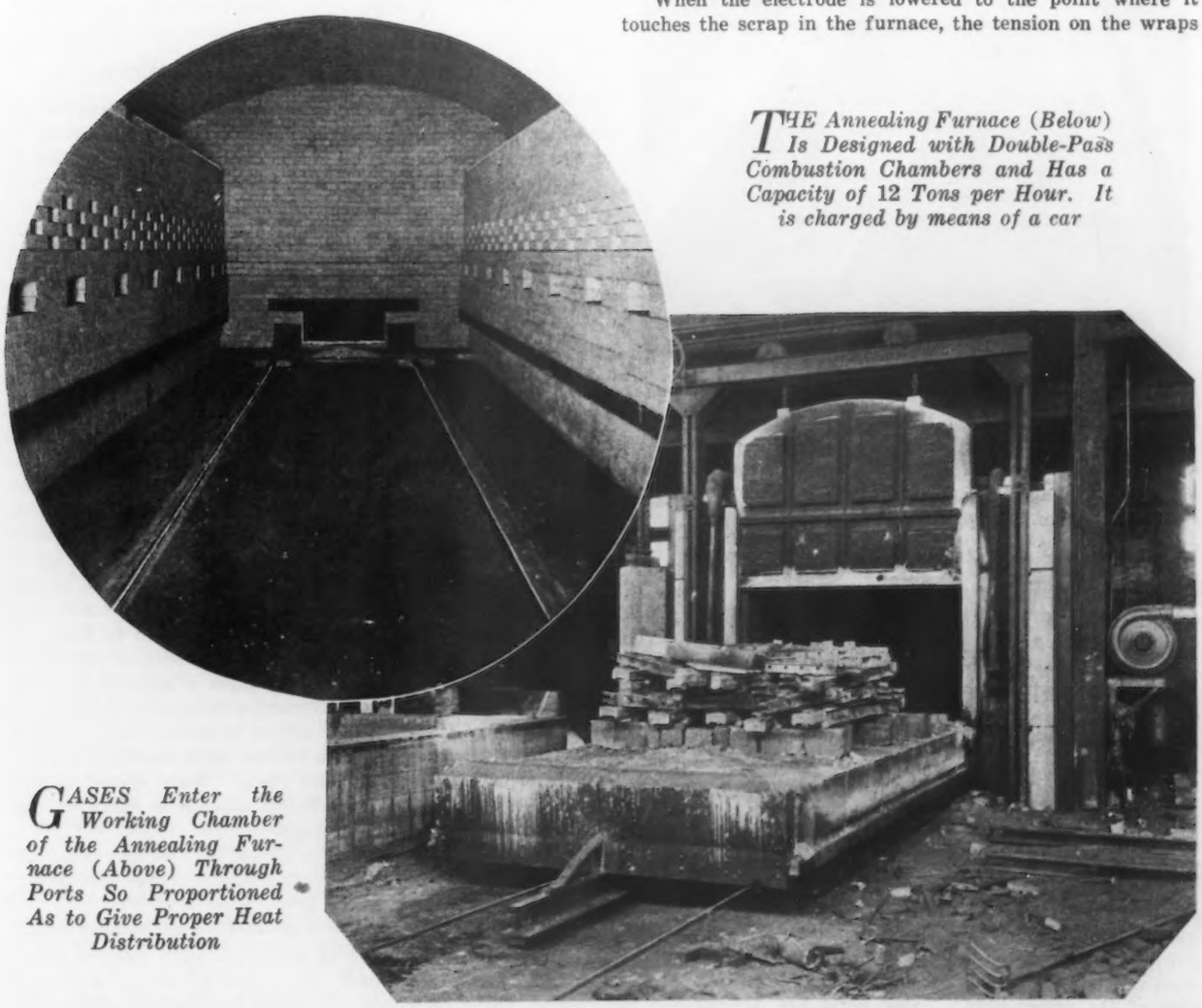
At the end of the distributing belt conveyor, sand is discharged to a large overhead hopper, fitted on the bottom with an 8-ft. apron feeder that delivers sand to long flasks used for making guard rails. These flasks are filled in about 4 sec., and the feed is regulated by electric push buttons, which control the motor operating the apron feeder. This sand-preparation and handling equipment was installed by the Link Belt Co., Chicago.

The 1½-ton electric furnace was designed by the Pittsburgh Electric Furnace Corporation, Pittsburgh. It has been located so that another unit, with a capacity of 3 tons per hour, can be installed at a later date. Power is supplied at 12,000 volts, three-phase, 60 cycles by the Commonwealth Edison Co., Chicago.

Electric Furnace Has Special Features

One of the features of the mechanical construction of this furnace is that ball and roller bearings are used throughout the electrode-operating gear mechanism, and the electrodes are counterbalanced so that the regulating circuit has only to overcome the inertia of the system. The electrode arms to which the clamps are fitted are fastened to one end of a flexible steel cable, which passes over ball-bearing sheaves and around a fiber sleeve on a winch drum and then up through ball-bearing sheaves to where a counterweight is fastened. This counterweight is equal in weight to the electrode arm plus the usual operating length of the electrode.

When the electrode is lowered to the point where it touches the scrap in the furnace, the tension on the wraps

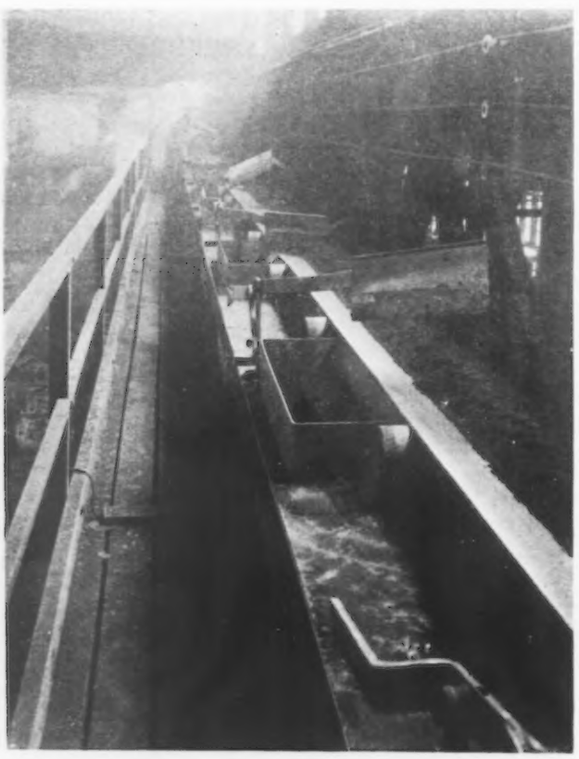


THE Annealing Furnace (Below) Is Designed with Double-Pass Combustion Chambers and Has a Capacity of 12 Tons per Hour. It is charged by means of a car

GASES Enter the Working Chamber of the Annealing Furnace (Above) Through Ports So Proportioned As to Give Proper Heat Distribution

of cable around the fiber sleeve of the winch drum is loosened and the sleeve expands, allowing the winch motors to turn without unwinding the cable further. The same operation occurs when the electrodes are raised too high. The counterweight then comes up against its stop and releases the "friction bite" on the fiber sleeves of the winch drums, and again the winch is free to turn without further overhauling of the cable. This system of counterweighted friction-bite hoist mechanism avoids the use of limit switches at the top and bottom of the travel of the electrode arms.

The core drying oven is 40 ft. wide by 80 ft. long. It is fired by means of coke heaters, and the temperatures range from 700 to 800 deg. Fahr. It is of the lift-door type and is loaded by means of cars, which are moved in and out of the oven by a crane. Made by the Swartwout



Prepared Sand Hoppers Are Filled from a Distributing Belt Conveyor

Co., Cleveland, the oven is constructed with walls containing 4 in. of insulating material, which is protected on both sides by 14-gage, rust-proofed steel sheets.

Annealing Furnace Has Reducing Atmosphere

The annealing furnace has a capacity of 12 tons of castings per charge. The annealing period is 6 hr., which is followed by a heat soaking time of 2 to 3 hr. The unit was designed by the Carborundum Co., Niagara Falls, N. Y., to anneal manganese steel castings in a reducing atmosphere at a temperature of about 1950 deg. Fahr. The loading car is 8 ft. wide by 18 ft. long.

A feature is the use of Carboradiant combustion chambers, by means of which uniform temperature and control of furnace temperature and atmosphere are said to be obtained. The combustion chambers, which are of the double-pass type, are arranged in pairs on both sides of the annealing furnace. One burner for each chamber fires into the lower pass, in which vaporization of the oil and mixing with air are accomplished. The gases are then led to the upper pass, from which they travel into the working chamber through ports provided by spacing the top tiles of the upper pass. These ports are dimensioned to so proportion the amount of gases discharged along the length of the chamber to give proper heat distribution.

These chambers are designed to have a uniform temperature throughout their length, and they deliver heat by radiation to the lower portion of the charge on the car, thus offsetting the drop in temperature of the gases as they pass down through the castings to the off-take ports located along the sides at the level of the car top.

Proper atmosphere is maintained within the furnace because the oil is vaporized and mixed with the air supplied for combustion before entering the working chamber. Burner adjustment is regulated by observing, through peep holes in the furnace shell above each combustion chamber, the color of the gases leaving the ports in the top of the combustion chambers.

Between the combustion chambers and the charge is interposed a firebrick screen wall, designed to regulate the radiant heat delivery from the combustion chambers to the load. The lower section of the wall is checkered to permit a greater quantity of radiant heat to reach the lower zone of the charge, where the combustion gases are at their lowest temperature. Excessive temperatures and destructive flame action are confined within the combustion chambers, conditions which the chambers are said to be capable of resisting because of the high refractoriness of the silicon carbide tile from which they are constructed.

The output of the foundry is varied. Several standard lines are made, such as manganese steel track supplies, centrifugal pumps to handle gravel and coarse material, and steam shovel dippers. The gray iron capacity is devoted almost wholly to jobbing orders, most of which come from railroads.

High-Pressure Steam Boilers

Conclusions as to the best type of high-pressure steam boiler under present limitations were recently submitted to the American Society of Mechanical Engineers by George A. Orrok, consulting engineer, New York Edison Co., New York. For three pressure ranges the conclusions are:

1—Very high-pressure boilers (2000 lb. and over). Flash type, tubes 2 in. or less in diameter, no header, no drums, all welded joints, except at collectors and manifolds where flanged or coned joints should be used. These boilers may consist of a single coil for small outputs or multiple coils as in the Benson boiler.

2—High-pressure boilers (800-1600 lb.). Water-level type, consisting of a bank of tubes of larger diameter than those indicated for the flash type, with walls not to exceed one-tenth of the outside diameter in thickness. Tubes to be expanded in headers or small-diameter drums whose thickness when exposed to fire should not exceed one-tenth of the outer diameter. Water-line drum should not contain when half full more than 10 per cent of the water content of the boiler. The boiler should be high rather than low, so that the water in the tubes may be under sufficient static head to insure steadiness of steam, and restrictions in discharge opening to steam drums should be sufficient to obviate serious moisture in the steam. Dry pipes or separators should precede the superheater. Steaming economizers should not be used, but the feedwater should be heated by economizer or the regenerative system so that little water heating is left to be done by the boiler itself. Water-cooled furnace walls should be used in sufficient amount to make the furnace repairs a negligible quantity.

3—With temperatures in excess of 750 deg. Fahr. we must be content with a shorter life of tubes and be prepared to replace coils or tubes from time to time. The only alternative is the use of much-higher-cost alloy steel.

Mr. Orrok discussed in his paper such matters as the effect of tube inclination, the releasing surface and steam space, boiler materials and safety in operation.

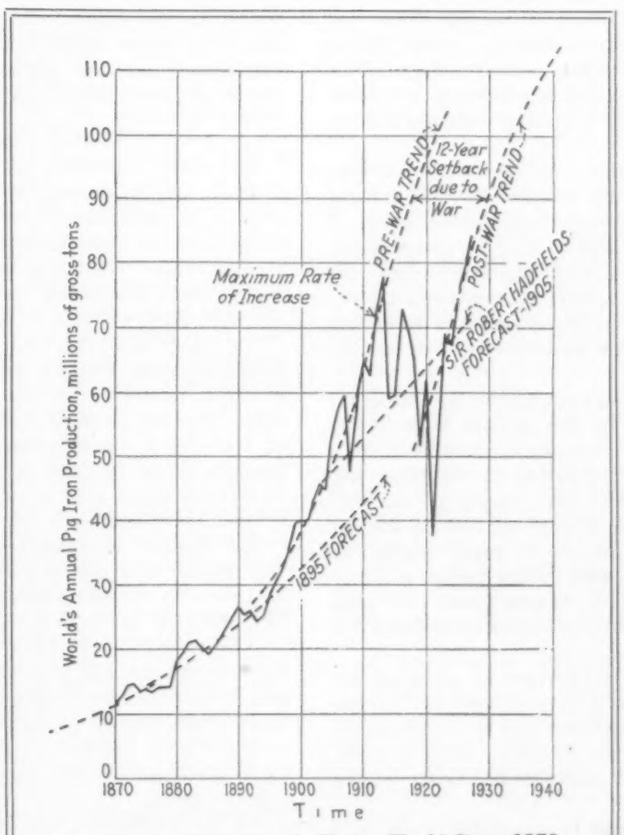
The Rising Tide of Iron and Steel

Curve of Production from 1919 to 1927 Closely Parallels the Record-Breaking Pre-War Trend

BY E. E. THUM

THE article by Edwin C. Eckel in the June 14 issue of THE IRON AGE, entitled "Iron Industry Facing Great Changes," contains many observations which should be thoughtfully considered by all men in the metal industries who are planning ahead for future growth. I find myself unable to agree with one of his conclusions, namely, that "we are not likely to resume our normal or pre-war rate of increase for a good many years to come." The very graph he uses to show the world pig iron output indicates that production is now, and has been since 1919, increasing at a rate closely parallel to the pre-war trends, save only for a 12 or 13-year setback due to that upheaval.

Of course, one cannot certainly predict the future from the past, except in elementary physical science; nevertheless, good information on past performances, interpreted in the light of current events, is the best basis for predictions about industrial developments. As a case in point, a person in 1895 would have been justified in plotting future production of pig iron in a slowly rising curve, extrapolated from the known trend up to that time. Subsequent history would have proved the conservatism of this prophecy.



Production of Pig Iron by Entire World Since 1870

Even in 1905, after the actual production had taken a definitely higher rate, Sir Robert Hadfield in his presidential address before the Faraday Society prophesied that the world's production would continue to increase at the same rate it had during the preceding 30 years; that is, slightly over a million gross tons yearly. The graph shows how much he underestimated the ability of the people to absorb iron; for it took the profound dislocation of a great war to bring his trend line within calling distance of actual production.

In making his calculations Sir Robert assumed that the 40 million tons of iron made in 1900 was consumed by only 200 million people; and if two-thirds of the total population of the earth would eventually use the metal at the same rate the annual consumption would be above 250 million tons. This gives what he thought was the eventuality—an annual consumption of 400 lb. per capita. But in the United States last year 120 million people consumed 35 million tons of pig iron, a per capita consumption of 650 lb. in round numbers.

On this basis it appears that the mechanical age has called for more and more iron; so the acceleration of production between 1904 and 1916 may be taken as a definite trend and not as a temporary burst of speed. But, of course, there must be a maximum some time. The production curve will sooner or later show a point of inflection. From then on the curve will reverse itself, gradually approaching the time when new production merely replaces natural wastage and decay. If such a point of inflection in the curve marked "pre-war trend" be placed at the year 1912 or 1913, and the line exactly reversed in curvature, I believe the predictions would not have been unduly optimistic and would have represented what would have happened in normal growth. Dr. John A. Mathews of the Crucible Steel Co. of America has also expressed the opinion that the rate of future increase will be curtailed through the economies resulting from alloy steels and corrosion-resisting alloys.

If this curve representing pre-war trend is moved over parallel to itself 12 years, it will be found to fit closely the recorded production since 1919. And why shouldn't it? The urge to use labor-saving devices, to travel with speed and comfort, to beautify our buildings, bridges and highways, is here just as strong now as before the war. The war absorbed so much wealth and man power that the entire civilized world staggered along in a dazed condition, having lost sight of the old economic landmarks. It is surprising such substantial recovery as is shown by the actual production figures could be made in as little as 12 years. But the figures show it has been done!

This post-war trend line crosses the year 1936 at a production of 105 million tons. Dividing this figure by the factor 0.87 (the ratio between world production of pig iron and that of steel, a constant ratio since 1915) the figure of 120 million tons is computed to be the expected produc-

tion of steel in that year. This checks fairly closely the figure 115 million tons, estimated as the probable 1936 production of steel, in THE IRON AGE editorial printed June 23, 1927.

I therefore agree with Mr. Eckel that the maximum rate of annual increase in iron and steel production may have been reached or passed. But I believe that nothing less than another devastating war will prevent the steady expansion in output called for by the post-war trend line sketched in the figure.

Production and Use of Die Castings

European and American Practice Contrasted—Availability Depends on Machining Labor Eliminated—Heavy Price of Dies Must Be Absorbed by Savings

BY SAMUEL TOUR*

GENERALLY speaking, the pressure die casting process requires (1) a machine capable of delivering molten metal under pressure to a die; (2) a metallic mold or die to receive the molten metal; (3) a suitable alloy which will function in the machine and form in the die, and which will yield a casting with the desired physical properties.

Die castings, properly speaking, do not include castings poured by gravity into a metallic mold or die, but presuppose the use of definite pressure. Proper combination of the three essentials noted gives a casting of sharp detail, finished or practically finished, requiring little or no machining, checking to close dimensional tolerance and rapidly producible in large quantities. The process often makes possible the use of much thinner walls than can be cast by any other method.

It is incorrect to say that castings cannot be considered as practical die-casting jobs in lots of less than 10,000 pieces. As a general rule, the pressure die-casting process is most economical where the elimination of machining and finishing operations is possible. The number of castings necessary to absorb completely the initial cost of the die depends, therefore, upon the amount of costly machining and finishing operations eliminated by the use of pressure die castings. Often this saving is so great that 1000 castings or even a few hundred will justify the construction of a die.

Present estimated annual production of pressure die castings in the United States is from 10,000,000 to 12,000,000 lb. of aluminum-base castings and from 50,000,000 to 60,000,000 lb. of zinc-base die castings. It is evident, therefore, that these types of castings are being widely used.

Pressure die castings are used in automobile parts such as steering wheel spiders, carbureter parts, oil purifier parts, oil pumps, fans, water pumps, electric starters, spark and throttle control parts, windshield wipers, instrument boards, speedometers, hand rests, interior trim handles, cowls, etc. They are used extensively in vacuum cleaners, washing machines, typewriters, check writers, adding machines, calculating machines, small motors, magnetos, radio condensers, radio frames, loud speakers, telephones, vending machines, instrument parts, instrument cases, small machine parts, ornamental parts, furniture, cooking utensils and electric refrigerators.

Producers generally purchase their raw materials in zinc, aluminum, lead and tin-base and mix their own alloys. Customers usually designate which type of alloy is desired and supply information as to service requirements of the finished castings. They then depend upon the producer to select, in the type specified, the particular composition which his experience tells him will result in the best castings for the purpose. Obviously, no one alloy will meet the service requirements of all such castings.

European Die-Casting Practice

In another appendix to the committee report, E. V. Pannell, consulting engineer, British Aluminum Co., Ltd., New York, discussed the construction of die castings in Europe, of the type commonly called by that name in the United States. In Great Britain it is estimated that the heavy metal die-casting production is from 3,000,000 to 5,000,000 lb. a year.

In some cases, he said, the machines used are quite primitive, being entirely manual in operation. A number of them, mostly of the plunger type, are of Swedish design. Another Swedish design, semi-manual, uses air also, at from 16 to 40 lb. pressure. With small castings this machine is driven from a counter-shaft and produces up to 30 castings an hour of not more than ¼ lb. each. With manual operation, much heavier castings can be made.

An English machine designed with plunger and rack and pinion feed has a die-preheating chamber. It will operate with metals up to a melting point of 930 deg. Fahr. The metal pot holds 55 lb. of zinc-base alloy.

The production of light alloy die castings in England does not possess the potentialities of the American situation. Castings from a given pattern are called for in relatively small numbers. As the orders average perhaps not over one-tenth the number called for in the United States on a single order, the die charges for castings are ten times as great.

In the automotive field, particularly, this limiting condition is found. In the United States 4,500,000 automobiles are produced by about 45 leading makers and average 100,000 each. In Great Britain 100 makers produce 150,000 cars, or an average of 1500 cars of a given design. Standardization, therefore, is carried to a much smaller degree than in America and the great diversity of parts called for is best served by the use of permanent-mold castings.

For reasons growing out of this situation, and similar situations in other industries, the entire annual production of light alloy die castings in Great Britain probably does not exceed 1,500,000 lb. A similar amount is produced in Germany and an appreciably smaller quantity in France.

In Europe there is a certain amount of prejudice against the use of the air-operated machine. This no doubt is on account of the relatively high cost of compressed air for a small shop. It is asserted also that air leakage and the behavior of compressed air on the molten aluminum are a disadvantage. Lack of density in the castings is mentioned.

*Metallurgist Doehler Die Casting Co., Batavia, N. Y. This is an abstract of an appendix to a committee report at Atlantic City in the last week of June, at the meeting of the American Society for Testing Materials.

Better Planning of Production Is Crux of Distribution Problem

Output in Keeping with Market Analysis Would Prevent Domestic Dumping, Says Economist —Research in Distribution Urged

THE problem of distribution affects our whole national economy; it is much broader in scope than the marketing program of the individual manufacturer, declared Magnus W. Alexander, president National Industrial Conference Board, New York, in addressing the distribution conference held in New York, June 28 and 29, under the auspices of the bolt, nut and rivet industry.

"Distribution," he said, "involves much more than transportation, marketing and handling. To many distribution means simply the disposal of their own output, that is, the problem of marketing their own goods. Market analysis and salesmanship, it is believed, can solve the problem. We must examine the issue, however, not from the standpoint of the individual producer alone, but from the broad viewpoint of national economy.

"It is seldom recognized that the distribution problem goes much deeper and, in fact, has its roots in production. Faultily planned production cannot be rectified—although in part it may be corrected—by even the most excellently planned marketing program, a fact evidenced in the failure of many carefully designed and strongly financed advertising and sales campaigns."

Growing Proportion of Employed Engaged in Distribution

One heritage of war days, Mr. Alexander pointed out, is our over-expanded plant capacity, a condition aggravated by a greatly accelerated pace of production resulting from continuously increasing industrial efficiency.

"The fact remains, however, and much evidence has been adduced to prove the point, that productive efficiency in certain lines, particularly in the last few years, has set a pace which might easily outstrip domestic consumption under present conditions. There has arisen, therefore, a great deal of discussion of the 'distribution problem.'

"Statistical data on the process of distribution are as yet remarkably scant," said Mr. Alexander. "It is claimed, on the basis of individual observations and on inquiries into specific lines of commodities, as agricultural products, for instance, rather than on comprehensive, scientific data, that the cost of distribution generally has been steadily and disproportionately increasing and that economic gains, achieved by efficiency in production, in part are lost by waste in distribution.

"We know that in many instances the consumer price is several times that of production cost, and census data for the past 50 years give substantial evidence that the economic cost of distribution has been constantly rising as compared with the cost of production. In 1870, 8,629,000, or 88 per cent of all those gainfully occupied in production and distribution combined, were engaged in production proper, that is in manufacturing, mining and agriculture, as against 24,470,000, or less than 70 per cent of all those thus gainfully occupied in 1927."

Domestic Dumping One Cause of Higher Distribution Costs

The essential waste in distribution, according to Mr. Alexander, occurs in the competitive over-production of certain commodities that happen to be convenient for the manufacturer to produce, resulting in expensive high-pressure sales campaigns and frequently in ruinously low prices. This kind of marketing has been characterized as domestic dumping.

"Every well informed business man knows," declared the speaker, "that goods are being sold continuously at or even below the cost of production. This naturally raises a far-reaching question: Is it economically sound and socially desirable that goods be sold without profit, or at a loss, over a considerable period of time? Is that sound or constructive competition?

"A producer may be able to dispose of a certain amount of his output at no profit or even at a loss and continue to exist by virtue of the profit made on the bulk of his output. But is it not inevitable, because of the interdependence of one business transaction on another, and the interdependence of all industries, that such a policy is bound to disorganize trade and in the end is bound to react disastrously upon him who sells at or below the cost of production?

"It is this very circumstance of selling a portion of quantity production at or below the cost of production that has sharpened competition between producers in many instances to the point of being ruinous, and probably has tended greatly to increase distribution costs where high-pressure selling has been applied."

The speaker urged more thorough market analysis and closer study of consumer demand to avoid needlessly sharp competition with resulting dwindling profit margins.

Large-Scale Enterprises Sharpen Competition

"One of the most interesting and significant features of our business evolution during the past decade," asserted Mr. Alexander, "is that large-scale enterprise, which a quarter of a century ago was feared as a danger to free competition, today is a prime factor in accentuating competition.

"Business conditions in the United States during the past decade have presented a paradoxical situation: Great national prosperity with record business activity, but at the same time a competitive struggle which has resulted in precarious profit margins.

"We see, furthermore, that the very method of production that has contributed so much to our national income, namely, efficient mass production, which has effected high productivity per worker and has made it possible to combine high wage levels with low prices, is the very factor that today is accentuating the competitive struggle and thereby emphasizing also certain distribution problems to which trade associations might well devote their earnest attention."

Although, broadly speaking, there can be no over-production, there certainly can be a surplus output of a given variety of commodity at a given time. "It is therefore in planning what to produce that the fundamental solution of the distribution problem lies," declared Mr. Alexander.

Jobbers and retailers, he indicated, are not necessarily to blame for mounting costs of distribution, as they are called upon by customers for increasingly elaborate service. The average ratio of profits to receipts is considerably smaller in trade than in manufacturing and other lines of business activity.

Some Increases in Distribution Costs Justified

"It is necessary in discussing the increasing costs of distribution to distinguish between what constitutes actual and avoidable waste, such as unnecessary cross-hauling, congestion of perishable commodities, unnecessary handling, misdirected high-pressure sales methods, and such other elements which increase distribution costs but add nothing to the products; and those elements in distribution that increase either the convenience or the desirability of the commodity and are demanded by the producer, as, for instance, packaging, quick delivery in small quantities and other various services performed by the dealer for his customers," said Mr. Alexander.

"These latter services in essence become a refinement of the products and are to be classed as manifestations of our rising standards of living rather than as costs representing economic waste."

Need for Scientific Research in Distribution

Prosperity in the United States in the past decade has been due, in large measure, to industrial productivity and the elimination of economic waste in production through mechanization, he asserted. Rationalization of the distributive process, combined with careful production planning, should result in a further substantial economic gain.

"The pressure of our present competitive struggle is a challenge to renewed effort to do our utmost in stimulating scientific research and to apply its results to production and distribution alike. Constant vigilance, comprehensive and accurate information and scientific analysis of all facts and economic trends having any bearing on our business activity are the keys to the maintenance of our economic well-being," asserted Mr. Alexander.

"Ours may rightly be called a machine civilization," said Mr. Alexander in conclusion, "but it should always be remembered that we owe to the machine both the leisure and the price for our cultural and social progress."

Individual Roller Table Drives

Improvement in Control, Compared With the Inflexibility of Group Drives —Breakdown of One Roller Does Not Cripple Train

GROUP roller drives, as for roller tables, whether of the cable and sheave type, or bevel gear type, lack flexibility in that the individual rollers cannot be controlled, said J. C. Dobelbower, Crocker-Wheeler Electric Mfg. Co., Ampere, N. J., speaking at the Chicago meeting of the Association of Iron and Steel Electrical Engineers. "In case of motor trouble, breakage of cable or gears, the entire table is out of commission. With the roll-out motor drive the failure of a driving motor affects only the one roller—in fact, a number of motors in the train could fail without a shutdown of the table. This also permits shutting down some of the motors, to produce a drag on the speed of the strip or bar, if desired. There are also fewer bearings to lubricate than on the group drive, which means less maintenance and fewer chances of trouble.

"With any of the types of motor for roller drive it is essential that the insulation throughout be such that it will stand up under the heat obtaining and all parts must be of extra rugged construction. In installing roll-out motors it is essential also that each motor be protected by an overload relay or fuse, to prevent roasting out in case the motor is stalled, due to jamming or any other abnormal condition, unless the motor is designed to permit stalling.

Control of Speeds Desirable

"Power for driving roll-out motors is best obtained by use of a motor-generator set. This should consist of a variable-speed d.c. motor driving an alternator. By the use of this combination the speed of the alternator can be varied, thus changing the frequency and voltage of current delivered to the roll-out motor. This permits the operator to control the speed of the strip or bar on the table.

"Roll-out motors of the general purpose design can, if desired, be ventilated. If this is done, however, it is necessary that clean air be supplied; the ventilation can be obtained by bringing the air in at one end of the motor at the bottom, and discharging it at the bottom of the opposite end. This type of motor, however, should not require ventilation, as it is comparable to any fully inclosed motor operating in a hot place. The roll-out motor of the design where the motor is built directly in the roller is, however, a different problem. The motor, in this case, is subjected directly to the heat from the strip or rod being carried on the outer surface of the motor. Thus heat is applied to the surface which, in the ordinary design of motors, is the surface from which heat is radiated."

American Standards Association to Succeed Standards Committee

Reconstruction of the American Engineering Standards Committee to keep pace with the growth of the industrial standardization movement in the United States is now under way, it is announced by the committee. The principal features of the reconstruction are the definite federation of national organizations, under the name American Standards Association, in such a way that trade associations interested in standardization may more readily join in the direction of the movement; placing the technical work of approving standards in a standards council; and concentrating administrative and financial responsibility in a board of directors composed of 12 industrial executives.

The underlying principles remain unchanged. The basic functions remain completely in the hands of the representatives of the member-bodies. The individual members, whether of the board of directors or of the standards council, are appointed or nominated by the member-bodies, which thus remain the fundamental units in the organization.

The name American Standards Association is being adopted as more accurately descriptive of the reorganized association, and also because of the misunderstandings and misconceptions which have frequently occurred in connection with the words "engineering" and "committee." The scope of the work is, however, being limited to those fields in which engineering methods apply.

Cast Steel Core for Bronze Gulls

To Support a Feature of a Monument on the Potomac to America's 30,000 Lost at Sea

TO the more than 30,000 Americans who have perished at sea since the nation was founded—heroes of naval battles and martyrs to commerce, rescue work or adventure, a striking monument is to be built on the banks of the Potomac River in Washington, on a site in East Potomac Park granted by Congress, not far from the National Cemetery in Arlington. The memorial is to cost $500,000. About a third of this sum has been contributed, many gifts coming from school children. A national campaign to raise the remaining $350,000 is being directed by William Fellowes Morgan, Jr., 107 Cliff Street, New York.

A reproduction below of a photograph of the model of this Navy and Marine Memorial shows the free-flying gulls, which make the monument an unusually interesting piece of sculpture. To support the considerable weight of the gulls the steel armature shown at the right was constructed at the Tietjen & Lang branch of the Todd Shipyards Corporation at Hoboken, N. J. Begni del Piatta, the sculptor who introduced the use of the steel, is shown seated in the center of the group.

Heat Savings from Insulating Furnaces

One Year's Operation May Pay Installation Cost—Quantitative Results Outlined and Thicknesses Recommended

INSULATION applied to open-hearth furnace regenerators has not only minimized radiation losses, but also has cut air leakage losses, said L. B. McMillan, consulting engineer, Johns-Manville Corporation, New York, in a paper before the Chicago meeting of the Association of Iron and Steel Electrical Engineers.

Among the advantageous results attained through the use of insulation on checker chambers are: (1) Direct saving in fuel consumed per ton of steel produced; (2) increased temperature of the preheated air and gas; (3) improved conditions of furnace atmosphere, due to reduced air leakage; (4) increased speed of heats; (5) increased production; (6) decreased losses during Sunday shutdowns; (7) increased temperatures in gases delivered to waste-heat boilers, resulting in increased steam production.

All of these results have been secured in varying degrees in many installations. In some cases the saving in fuel has been the outstanding advantage. In others increased speed of heats and increased production have been most noticeable. In still others the most notable feature was increased steam production in the waste-heat boilers. Naturally, with varying conditions of operation the various items will not show up in the same proportion in each installation. But in every installation investigated it was found unmistakably apparent that highly desirable results were being obtained, and this without detrimental effect on the brickwork, where insulation was properly proportioned to the conditions encountered.

Air Infiltration Is Bothersome

There are cases where the spaces around the checker chambers are well ventilated and relatively cool, with correspondingly lower wall surface temperatures, yet where the losses are undoubtedly greater than in others where the chambers are in confined spaces, where much higher temperatures prevail. In still other cases, the rate of air infiltration through the walls is such that the temperature of the wall may be deceivingly low. In such cases losses by radiation may not be excessive, but air infiltration losses in such cases are none the less real and preventable.

The best means of estimating the savings in heat transmission losses is through the use of calculations based on the thicknesses and conductivities of the materials, and the temperature conditions involved. Such computations show that, in reduced transmission losses alone, the insulation of checker chambers is fully justified; and the saving through reduction of infiltration losses is just so much more net gain.

Calculating the Benefits in Dollars

What these savings in B.t.u. an hour really mean is best visualized by expressing them in terms of savings in dollars per 100 sq. ft. a year. In the case of a 13½-in. roof at an average inside temperature of 2400 deg. Fahr., the saving in B.t.u. an hour by 2-in. insulation is 443 B.t.u. If the furnace is operated 6000 hr. a year, the equivalent saving in dollars per sq. ft. is 53c.; or $53 per 100 sq. ft. a year, even at a value of heat of only 20c. per 1,000,000 B.t.u. This annual saving is considerably more than the cost of the insulation, so that the initial cost is repaid in a few months' operation, after which the saving is clear gain. In fact, from the heat-saving viewpoint, the use of much thicker insulation would be justified. But other practical considerations make it advisable to limit the thickness of efficient insulation on the roofs to about 2 in., which successful installations have shown to be entirely safe.

On side walls, however, thicker insulation may be used and the heat loss reduced to a more economical basis, without fear of danger to refractories, because the brick work is thicker, and the average temperatures are lower. It is true that the temperatures to which the upper portions of the side walls are exposed are the same as those under the roof, but the omission of insulation at the skew back, and the downward flow of heat through the thick wall to the cooler lower portions, prevent the raising of the mean temperature of the wall to a dangerous point, even in the case of the portion above the checkers.

Saving by 4-in. insulation on an 18-in. firebrick wall at an average inside temperature of 2000 deg. Fahr. is 365 B.t.u. per sq. ft. an hour. This is equivalent to a saving of $44 per 100 sq. ft. a year on the basis of 6000 hr. operation and a value of heat of 20c. per 1,000,000 B.t.u. This saving is sufficient to pay an annual return of about 70 per cent on the investment represented by the cost of insulation. A thickness of insulation of 3 in. to 4 in. is clearly justified on these portions of the side walls.

Percentage Factors Do Not Tell the Story

Referring to the question of savings in terms of total fuel cost, a word of warning was issued in connection with such percentages. Percentages are useful if properly interpreted; when misinterpreted, they are likely to be highly misleading. A saving of 3, 5, or even 10 per cent might look small in comparison with total costs, or with savings which might be effected in other directions, as by more careful operation, etc. The true perspective is obtained by comparing the annual saving with the annual cost of effecting that saving, regardless of what percentage relationship these bear to the total operating cost. In the case of insulation, the saving may appear to be small when expressed as a percentage of the total fuel bill, but likewise the annual cost of maintaining the insulation is a still smaller percentage of that small total fuel bill, therefore the saving looms large when compared with the cost of effecting it.

Example of a Well-Designed Insulation

In a typical installation of new checker chambers the walls above ground, and to a point about 1 ft. below grade, are insulated to a total thickness of 3¾ in. with block insulation applied in two layers, so that the second layer overlaps all of the joints in the first layer. Temperature measurements on checker chamber walls insulated in this manner have shown an average of approximately 1200 deg. Fahr. between the insulation and the firebrick. This increased temperature at the outer surface of the brick demonstrates the effectiveness of the insulation in limiting heat flow through the wall, and yet is not so high as to result in a dangerously high mean temperature in the brickwork.

The roofs are insulated to a total thickness of 1¾ in., with 1¼-in. block insulation and ½-in. cement. The use of as thick insulation on the roofs as on the side walls

should be recommended, but observed temperatures averaging approximately 1100 deg. Fahr., between the 1¾-in. construction described above and the brickwork, indicate that the thickness of insulation could be increased to 2 in. without endangering the brickwork. The fact that the temperatures under the roof are not maintained continuously at the maximum point, and that the peaks are of very short duration, insures that the mean temperature of the brickwork is well within the range of safety.

Earth Is Not a Natural Insulator

The walls below grade and the floors of the chambers are insulated with 2-in. block. It was formerly the general belief that, because of the resistance to heat flow offered by dry earth, insulation was not required on the underground portions. However, a more thorough analysis of the situation shows that the use of some insulation on these portions is highly advisable, but probably the thickness used should not exceed 2 in. The earth may not in most cases be dry at any great depth below the chambers, and the evaporation of moisture which penetrates into the dry zone around the furnaces represents a considerable expenditure of heat.

Furthermore, the theory as to the relative insulating effect offered by the dry earth is based on the so-called "steady state" of temperatures. But this steady state is not even approximately attained for many months after the furnace starts up. All the while during this period heat is being dissipated, to increase the temperature of the surrounding earth, and before this rate of dissipation becomes negligibly small the furnace is shut down to be reconditioned for another campaign. Still another justification for insulation on these portions is, of course, the protection which it affords to the foundations and steel buckstays.

Insulation of existing checker chambers is just as important as in the case of new ones. In some cases it may be even more important, because of the effect of insulation in minimizing air infiltration losses. The block insulation itself provides a considerable increased resistance to air leakage and, furthermore, the outer surface of the insulation may be maintained more effectively airtight than the bare brickwall. The walls above grade and the crowns may be insulated as described above for new furnaces, except that, in cases where rebuilding is anticipated within a few years, the thickness of insulation may be reduced somewhat, as, for example, to 3-in. thickness on the walls and 1½-in. thickness of blocks on the roofs. Insulation of the underground portions of old checker chambers should, of course, be deferred until the time of rebuilding. But, since the savings by insulation of the above-ground portions repay the cost quickly, even a few years' use would make that part of the work a profitable investment.

Producing Wide, Thin Strip and Skelp

Arrangement of Mills and Their Motor Drives to Roll With Minimum Chilling and Low Power Drafts

TOLERANCES to which skelp must be rolled are usually not extremely close, and the gage for a given width is usually heavier than for other strip. These general conditions were outlined by A. F. Kenyon, Westinghouse Electric & Mfg. Co., East Pittsburgh, in a paper entitled "Selection of Main Drive Motors for Strip and

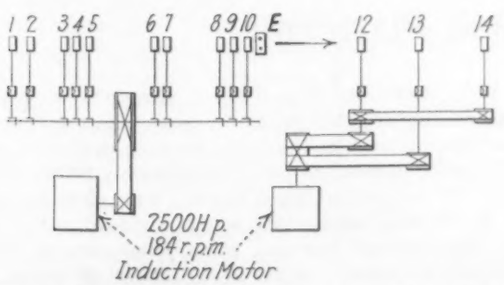


Fig. 1—Continuous Skelp Mill, 13-In., With Rope Drive. The stands are so spaced that the steel is never simultaneously in two groups of roughing stands or two stands of the finishing train

Skelp Mills," read at Chicago last month before the Association of Iron and Steel Electrical Engineers. "Most skelp mills," he pointed out, "do not require the refinements of arrangement which are so necessary to the successful operation of a strip mill.

"For light and medium tonnage production of the smaller sizes, a simple mill train, or a looping finishing train with a separately driven roughing stand, serves well. Wide skelp is produced in much the same manner and on the same types of mills as plate. The 13-in. continuous skelp mill shown by Fig. 1 is laid out to roll skelp in sizes ranging from 1 3/16 in. wide x 0.067 in. to 0.115 in. thick, up to 7¾ in. wide x 0.160 in. to 0.225 in. thick, at a delivery speed from the last stand of about 1150 ft. a minute.

"Ten roughing stands are arranged in four groups, the groups being so spaced that the same piece is never in more than one group of stands at any one time, although it may be simultaneously in the two or three stands of each group. The finishing stands, also, are spaced so that the pieces run out before entering the succeeding stands. The mill is driven by two duplicate 2500-hp., 184 r.p.m. induction motors through rope drives.

"With the more recent installations, gear drives rather than rope are generally used, and there is also the tendency

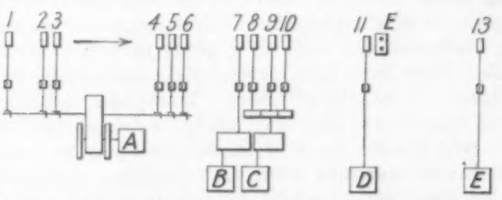


Fig. 2—Gear Drive with Multiple Motors, Applied to a 14-In. Continuous Skelp Mill, with Spacing Similar to That in Fig. 1. The motors include

	A	B	C	D	E
Hp.	1,500	1,000	2,000	1,000	1,250
R.p.m.	491	293	294	209	294

to apply a greater number of motors, to lessen the complications of the gearing. Fig. 2 is an example of a 14-in. continuous mill, designed to do practically the same work as the mill just described, and with a similar arrangement of the roll stands. With the greater number of driving motors, the diversity of load from the several stands is not so great, and installation of a greater total horsepower of motors is necessary than if the mill were driven by one or two large motors. It is noted that the total horse-

power of motors on the mill shown in Fig. 2 is 6750, as compared with 5000 on the mill shown in Fig. 1.

Compactness Has Several Advantages

"In other forms of skelp mills, the stands are all closely spaced in a continuous line, so that a single billet may be in all stands simultaneously. Such mills are very compact in their arrangement, require little labor to operate, and finish rolling at a fairly high temperature,

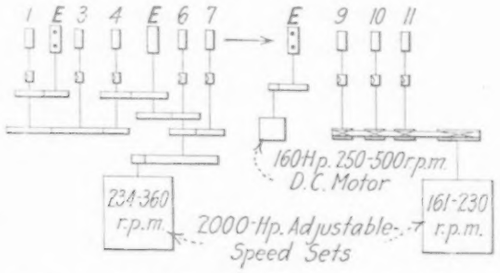


Fig. 3—Close Spacing of Stands in a 10-In. Continuous Skelp Mill Driven by Gearing and Belt from Three Motors. Compactness and low labor and power costs are features

so that the energy consumption for a given rolling schedule is usually less than for a mill where the steel runs out between passes. The 10-in. mill shown in Fig. 3 is so laid out. The seven roughing stands are driven by a 2000-hp., 234 to 360 r.p.m. rotary-converter type adjustable-speed set. The edger is separately driven by a small d.c. motor, and the three finishing stands are driven through belt by a second 2000-hp. adjustable-speed set. The maximum delivery speed is approximately 1100 ft. a minute.

"Two of the most recently installed skelp mills are driven entirely by direct current adjustable-speed motors. Adjustable-speed drives are almost a necessity for a mill rolling any great range of product sizes, and where the motors are of small or medium size, and closely grouped together, direct current often works out to advantage. On two other large sheet bar and skelp mills the greatest economy in first cost and efficiency in operation were realized by a combination of alternating current drives on the roughing and intermediate sections and direct current drives on the finishing stands, where the maximum flexibility and ease of control are desired.

"Active demand for long lengths of 16-gage and lighter material up to widths of 16-in. or more, by the automotive, metal furniture and other industries, has caused the installation in recent years of a large number of mills especially designed to produce this wide, thin-gage strip. The thin strip cools very rapidly. Thus, to expedite rolling and permit the finishing of the process at a sufficiently high temperature, the stands are closely spaced in tandem, and the material is rolled at comparatively high speeds.

Anti-Friction Bearings Change Conditions

"The latest development in rolling thin, flat products is the use of four-high mills with the backing rolls supported by roller bearings. Such mills make it possible to roll the thin gages up to widths of 48 in. or more, and in lengths of several hundred feet.

"Roll neck friction in such mills is much lower than in mills with plain bearings, and a marked reduction in power requirements and energy consumption is to be expected. For instance, several conventional strip mills rolling 16-in. to 20-in. wide 16-gage strip, at delivery speeds of about 1200 ft. a minute, have 1800-hp. motors on the finishing stands, and these motors are at times operated above their ratings. Modern mills with roller bearings, rolling 30-in. to 36-in. wide 16-gage strip at delivery speeds of about 800 ft. a minute, impose loads on the finishing stand motors of about 1500 hp., indicating a saving in power requirements of about 40 per cent. On some mills roller bearings are used on the roughing as well as the finishing stands. But it should be noted that the greatest savings in energy consumption are to be made on the finishing stands, where the rolling pressures are very high."

Standardization of Skid Platforms

Possibilities of the application of a simplified schedule in the manufacture of skids or platforms for use with elevating trucks have been surveyed by the division of simplified practice of the Department of Commerce. At present these platforms are made in a great variety of sizes and shapes. They have been developed in most cases to meet the needs of individual users. While the necessity for special sizes and forms may always exist, a brief survey shows that a wide range of commodities may be loaded on platforms of standard width and height.

Among the main considerations to be taken up at a conference of truck and skid manufacturers, and of railroads and other users, which is to be arranged for by the division, will be cost of manufacture and convenience and conformity to needs of users. In considering dimensions for the platforms, one factor will be economical packing in freight cars. One railroad company has adopted a skid of such dimensions that 24 can be loaded into a standard 50-ft. box car, leaving room opposite the doors for the lift-truck to enter.

Using interchangeable skid and truck equipment, certain shops and consignees have found it possible to save over 75 per cent of the cost of packing and boxing materials and over 90 per cent of the labor cost of loading and unloading freight cars. One paper company now loads a freight car with flat paper stock on skids in 45 min., using two men. Formerly it took seven men 3 hr. to load the same quantity of goods packed in boxes, and the boxes cost three times as much as the skids, for each carload of goods.

It has been estimated that approximately 9,000,000 skids are now in use in the United States. This gives an indication of the wide application which standardization might find. One railroad company alone, after certain changes are completed, expects to use about 100,000 skids and more than 3000 lift-trucks for handling and storing supplies and other materials.

What Trade Associations Must Do

There are four things every trade association must do, says E. St. Elmo Lewis, of National Services, Inc., Detroit, and they are:

(a) It must have an aggressive, faithful and competent leadership and a membership loyal to the purpose and plan.
(b) It must have a plan of action based on a competent, unbiased analysis of the trade's requirements.
(c) It must have an adequate and competent staff to do the work.
(d) It must have a program that realizes the necessary time, and a budget that fully covers the expense of putting the plan into execution.

Mass Production Begets Overproduction

Surplus of Goods Natural Result of Mass Methods —Remedy Lies in Better Distribution and Regulated Output, Says G. M. Verity

MASS production naturally begets overproduction, and this fact must be recognized by industrial executives if they hope to stay on the road to success, according to George M. Verity, president American Rolling Mill Co., Middletown, Ohio, who recently discussed fundamental economic problems with a member of THE IRON AGE staff. The interview centered in the present dilemma of industry, with mass output expanding as costs are lowered and with increased production, in turn, resulting in more intense competition.

The present era of quantity production is mainly accounted for by the invention of mechanical equipment and the introduction of better processing and fabricating designed to replace less efficient manufacturing methods. A disagreeable by-product of these changes, however, is the tendency of profits in many lines of manufacture to shrink as competition grows keener.

Economists and industrialists alike are perplexed and are trying to find new business principles that will guide manufacturers safely through their current difficulties. When Mr. Verity was asked to name policies he regards as essential to the successful conduct of a manufacturing industry, he pointed out that mass production methods normally tend to result in surplus output and that the remedy, in his opinion, lies in better distribution and effective measures to control production. Severe competition also places new emphasis on the importance of a satisfied and loyal employee personnel. His remarks follow:

"THE rapid growth of mass production through better mechanical methods brings with it the problem of an output that may be in excess of the consuming capacity of the country, except in periods of a peak demand."— GEORGE M. VERITY

"From a marketing standpoint, the successful corporation of the future must have its costs of production so sound that it will be prepared to sell its products at a price that will encourage an increased consumption and still make satisfactory earnings on its capital investment. It is economically impossible to get what might be termed a high price for a product manufactured on the basis of mass production, and industrial executives might as well make up their minds to accept that fact.

Must Find Legal Way to Control Output

"It is true that the rapid growth of mass production through better mechanical methods brings with it the problem of an output that may be in excess of the consuming capacity of the country, except in periods of a peak demand. This is a factor, however, which has evolved from the laudable and necessary effort of every manufacturer within an industry to improve his manufacturing methods. Its presence brings before us for solution the still large problem of distribution, which has now become the most serious and the most important problem confronting industry. In this connection, it seems to me not unreasonable to suggest that in the interest of the public at large some legal way must sometime be found whereby industry can control its production within reasonable bounds.

"The successful corporation of the future must give a maximum of service, fairly and equitably distributed among its clients, its working organization and its stockholders, and it must, at the same time, fully respect the rights of the public at large. It must be efficient in a superlative degree and it must be a good and loyal citizen. The part that it can play in the life of the community in which it is situated has infinite possibilities for good.

"That the replacement of man power by machinery will be productive of serious unemployment is a theory which may well be heavily discounted. What it will do is to eliminate much of the less desirable kind of work, but in its place will be substituted jobs of a higher order which will tend to develop the best ability of the workmen. Furthermore, the heavy influx of labor into this country has been effectively curbed by the enforcement of the present immigration law. With the large natural growth of the United States, its normal industrial needs will increase from year to year, and, while a temporary displacement of labor may result from mechanical progress at some particular time in one particular line of industry, the opening of new channels of commerce as well as the widening of old channels should more than take care of the number of available workmen.

Esprit de Corps Essential

"The successful industry of the future must be thoroughly integrated in its manufacturing processes and must be large enough to enjoy the lowest possible costs of production and distribution in line with the best practical and scientific standards of the day. One of the fundamental factors which it must possess is a fine spirit of cooperation and great efficiency in organization and in management. It must respect the highest standards of compensation.

Yet wages and salaries are, in truth, only a secondary matter, for they in themselves will not create loyalty and the spirit of cooperation which must exist if the greatest results are to be accomplished. The minds and the hearts of all those a part of a working organization must be reached in order to get them to respond in behalf of the common good and to adapt themselves willingly to changing conditions. If this is not done, modern technical achievements in industry would in many cases be far less effective than they are and, in some cases, would be entirely impossible.

"Years ago companies paid slight attention to the working conditions of their employees. Gradually, however, a social consciousness was created and effort was put forth to provide better sanitation, more comfortable working quarters, safety devices and other means enabling men to do their work to better advantage. All these things were done within the four walls of the industrial plant.

Paternalistic Attitude Toward Employees to Be Avoided

"But it was not long until companies realized that what their men did outside the plant also was of great importance. Consequently, attention was given to the matter of helping them acquire adequate and attractive homes and of helping to make the conditions surrounding their domestic life as happy as possible. Care necessarily had to be exercised to avoid assuming a paternalistic attitude, and the plan that has been supported by many companies has been one of mutual helpfulness rather than that which might bear the malodorous title of 'welfare activities.' In our own company, we have an example of what has been accomplished in that line, as the majority of our men are home owners.

"The importance of the human side of industry cannot be stressed too much, for upon its natural and healthy development depends not only the success of pioneering in mechanical, technical and metallurgical fields, but in solving of the daily problems of production and distribution. The creation of an esprit de corps, the feeling that all are working for a common cause, is the groundwork or setting back of important discoveries and of the solution of what is often regarded as an inexplicable problem. Selfish motives are effaced and the good of the organization becomes the major consideration. The strength of industry, as in an army, is in its organization. The right men, properly trained, properly placed and fully instructed and inspired, can often accomplish the seeming impossible."

Using Heavy Steel Beams in the Desert

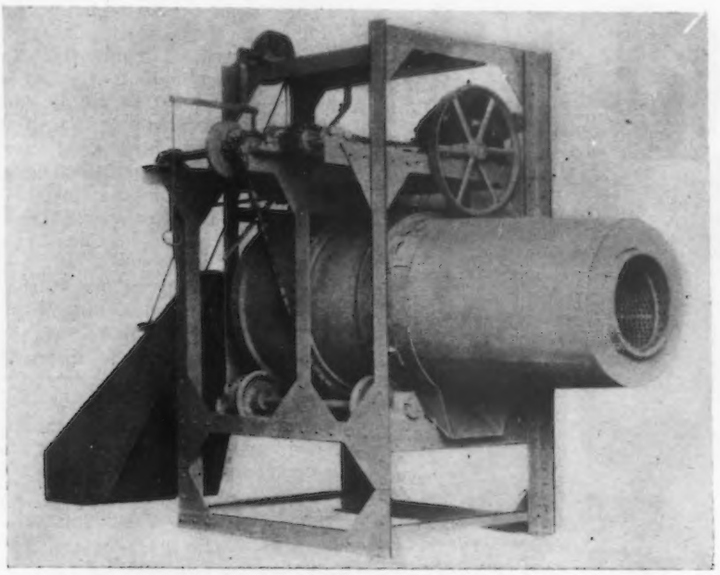
SOME of the difficulties involved in building a bridge over the Grand Canyon of the Colorado River may be visualized in the two illustrations. This work is being done by the Kansas City Structural Steel Co. Every beam has to be hauled 150 miles by truck over exceedingly rugged country. It was necessary to build a temporary town to take care of the needs of the workmen, and to maintain a fleet of motor trucks to haul in their supplies from the nearest railroad point.

AT Right Appears One End of the Bridge Jutting Out from the Rugged, Stratified Wall of the Canyon

HAULING Heavy Steel Girders Over Rough Country by Means of Motor Trucks and Trailers on Roads Which, in Part, Had to Be Prepared for Their Use

Star Return Tumbling Barrel for Forgings, Stampings and Castings

IDEAL Industrial Machinery, Cincinnati, has developed a new star return tumbling barrel for tumbling drop forgings, heavy stampings and castings. The parts are tumbled with stars or slugs, together with flint shot, silica sand or steel shot, the weight of stars being approximately equal to the weight of the parts to be tumbled. In this way the parts are prevented from touching each other, being floated in the stars. The results achieved, it is claimed, are not to be distinguished from a sand-blasted finish. It is stated that scale is removed even from alloy steel forgings without denting the work and without destroying the corners or designs on the parts.



Work Is Charged By Means of a Power Loader and Is Discharged Automatically. The stars return to the tumbling compartment automatically

Work is charged into the barrel by means of a power loader. In discharging, the rotation of the barrel is reversed, and the work automatically comes out at the end of the screen. The stars and sand are separated and fall into a cone-shaped jacket, which surrounds the screen. When the barrel is again rotated in the tumbling direction, the stars automatically return to the tumbling compartment. A minimum of labor is involved.

Transfer and separation of the stars is accomplished by means of a patented cup arrangement in the head between the tumbling compartment and the cone which surrounds the separating screen.

Machines are built in a range of sizes with tumbling compartments that measure from 18 x 24 in. to 48 x 60 in. Rigidity of construction for the hard usage they are intended for is a feature stressed by the manufacturer. Barrels are equipped with a hood for connection to the standard exhaust system. It is planned to show the equipment for the first time at the forthcoming International Steel Exposition, to be held in conjunction with the annual convention of the American Society for Steel Treating.

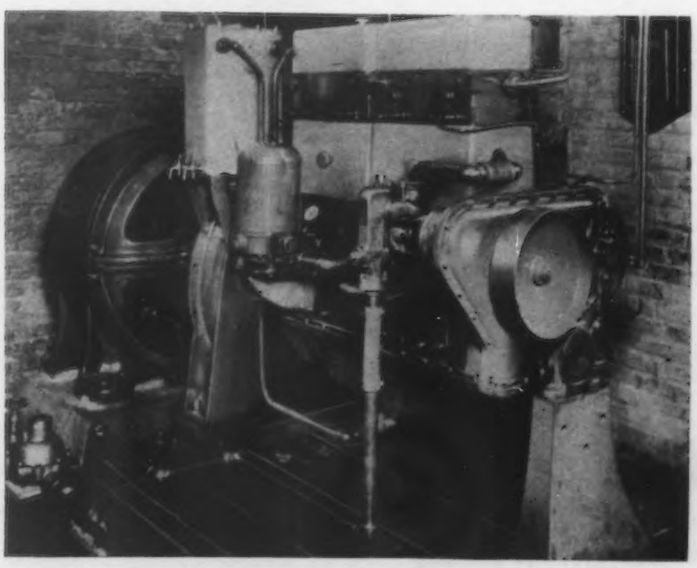
Diesel Generating Set Furnishes Direct Current for Crane Operation

WHILE alternating-current electrical energy is almost universally furnished by central-station companies, many plants require direct current in some phase of their manufacturing processes. Overhead traveling cranes, if the advantages of dynamic braking are to be gained, require direct current. Dynamic braking cannot be obtained with a. c. motors, because they cannot be automatically reversed. But d. c. motors can function as generators and provide effective and efficient means of braking. In addition, d. c. motors afford high starting torque and close speed regulation, both important considerations in crane operation.

To provide a source of direct current for this purpose, an engine-driven generating set has been put out by the Buda Co., Harvey, Ill. The set illustrated consists of a Diesel engine direct-connected with a 65-kw., 900-r.p.m., 250-volt, 260-amp., d. c. generator. It furnishes power to three 5-ton cranes and one 3-ton crane, which are operated in a foundry and machine shop. The 5-ton cranes are equipped with 11-hp. motors on the hoist and bridge and 3-hp. motors on the trolley, while the 3-ton crane is equipped with 5-hp. motors on the hoist and bridge and a 2-hp. motor on the trolley.

As the cranes in the foundry operate on a 24-hr. schedule six days a week, there is a continuous demand on the generating set. The load fluctuates from 1 to 300 amp., and often increases instantaneously from zero to maximum. This set is said to provide continuous service, and to withstand the wide variation in load, without greatly affecting the voltage regulation. The engine, built under license from the M. A. N. Co. of Germany, is of the four-stroke-cycle type, and fuel is injected without the use of an air compressor. It is provided with a self-starter, and no heating devices are required.

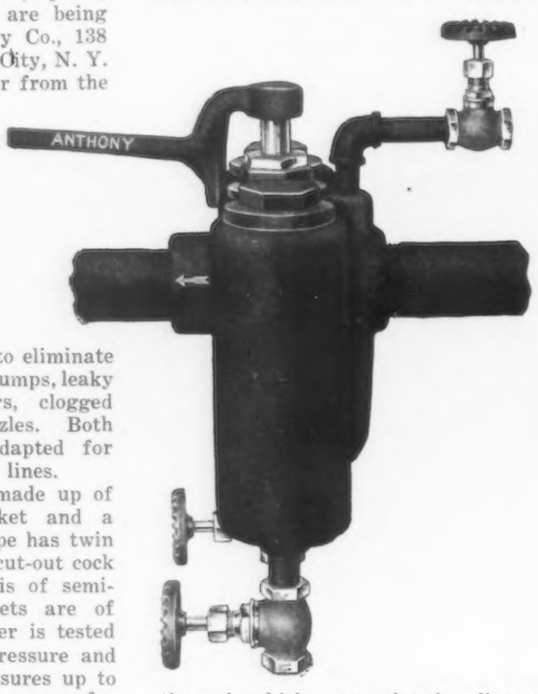
With low-priced fuel oil, electricity can be generated at as low as ½c. a kwhr. for fuel and lubricating oil.



Self-Contained Generating Set Consisting of a Diesel Engine Direct-Connected with a 65-Kw. 250-Volt Direct-Current Generator

Strainers for Fuel Oil and Other Fluid-Conveying Systems

STRAINERS of single and duplex types, for use in connection with systems for conveying fuel oil or other fluids, such as water, tar, paint, chemicals, steam and air are being marketed by the Anthony Co., 138 West Avenue, Long Island City, N. Y. In removing foreign matter from the liquids, the device is said to eliminate a common cause of worn pumps, leaky valves, inaccurate meters, clogged controls and clogged nozzles. Both types of strainer are adapted for either suction or pressure lines.



The Blow-Out Arrangement Permits Purging the Baskets Without Interruption to Flow of Liquids in the System

The single strainer is made up of a body, cap, basket, gasket and a drain plug; the duplex type has twin parts, and, in addition, a cut-out cock with handle. The body is of semi-steel and standard baskets are of sheet brass. Each strainer is tested under 500 lb. hydraulic pressure and is suitable for steam pressures up to 250 lb. The single strainers are for use with liquids which contain a small amount of foreign matter and for pipe lines that may be cut out of service temporarily for cleaning. The direction of flow is from the outside to the inside of the strainer basket so that sediment accumulates in the reservoir which surrounds the basket. A connection is provided at the bottom through which accumulated sediment can be drained or forced out under pressure. For viscous solids, the cap at the top can be removed and the basket cleaned with kerosene or other medium.

Strainers of the duplex type, illustrated herewith, are intended for liquids that contain an appreciable percentage of solids or a trace of viscous residuum and in pipe lines where even temporary interruption to the flow is objectionable. This device has two straining chambers in one body, each chamber being a complete unit within itself. The flow of liquid through both chambers is controlled by one cock, one movement of the handle of which cuts out either chamber, as desired. The direction of flow is from the outside to the inside of the baskets, as in the single pattern strainer. The cleaning operation is simple. The strainer need not be taken apart and tarry and sticky matter is removed from the clogged baskets without burning or washing with kerosene. Drain connections are provided at the bottom.

An outstanding feature of the device is the blow-out arrangement by which all chambers can be purged and the baskets blown free of obstructions without interruption of flow of the liquid. The blow-out connection is located at the top of the strainer, as shown, and when connected to a steam, compressed air or water line, either chamber of the strainer can be cleaned rapidly. Obstructions are blown from the mesh in the reverse direction to the normal flow, and forced with the sediment through the drain.

The duplex strainers are available in three standard sizes, ½, 2 and 4 in., respectively, the nominal size being designated by the pipe size of the inlet and outlet connections.

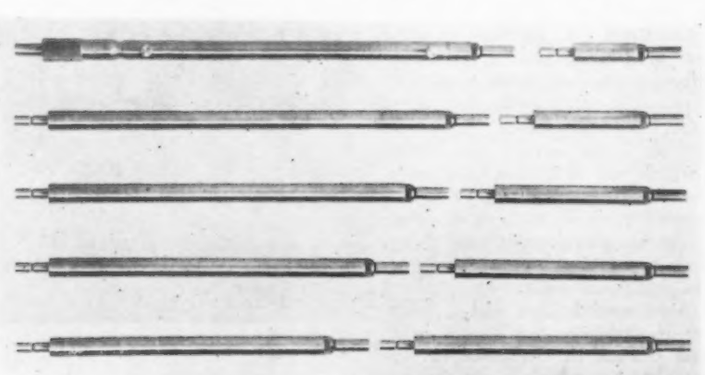
Offers Tubular Inside Micrometers and New Micrometer Calipers

TUBULAR inside micrometers, in three sizes to measure from 12 to 22 in., 22 to 32 in. and 32 to 42 in., respectively, have been added to the line of the Brown & Sharpe Mfg. Co., Providence. Each tool is graduated in thousandths of an inch and the range of measurements of each tool is obtained with ten interchangeable anvils of different lengths. The micrometer head has a movement of 1 in.

The shoulders of the anvils fit against the shoulder of the micrometer head, assuring positive alinement and accurate measurements. The anvils are held in place by a clamp-screw which fits into a V groove and may be changed conveniently. Adjustments may be made quickly and the micrometer locked at any reading. The measuring points are hardened and the faces are ground on a radius, which adapts them for measuring parallel or curved surfaces. Metric micrometers of this type are also available.

Two new micrometer calipers, designated as the Nos. 60 and 62, have also been announced by the company. These tools are similar to the company's Nos. 61 and 63, except that they do not have clamping rings. They are obtainable with graduations in either thousandths of an inch or thousandths of a millimeter. One tool measures from 1 to 2 in. and the other from 2 to 3 in. Both tools have solid anvils and simple adjustment for wear of the measuring surfaces. They are furnished with or without standards and with or without ratchet stops.

The Measurement Range of the Inside Micrometers Is Obtained with the Anvils Shown at the Right



Expansion of Bethlehem Shipbuilding Corporation in Boston Area

Announcement has been made of acquisition by the Bethlehem Shipbuilding Corporation of the Atlantic Works in East Boston. This plant, which has long been established as a ship repair unit, covers 15 acres and has equipment including 22 buildings and two dry-docks. It is located on the main ship channel, directly opposite the United States Navy Yard.

Together wth the Simpson Works, also owned by the company, the repair facilities of the Bethlehem company in East Boston now include three steel floating dry-docks, ranging up to 10,000 tons capacity, three graving dry-docks, of which the longest is 465 ft., and three marine railroads, the largest being of 2000 tons. Both these works are located within 10 miles of the Fall River Shipbuilding plant of the Bethlehem organization at Quincy.

Shops at both the repair yards are completely equipped with tools and machines required for any kind of marine and miscellaneous machine and boiler work. The largest graving dock and the largest floating dry-dock are served by a 15-ton traveling crane. Smaller docks and the marine railroads are served by cranes also, of lighter capacity. One feature of the equipment available is a barge fitted with boiler and air compressor, together with welding sets, making it possible to carry out many repairs at steamship berths instead of requiring the ships to be taken to one of the yards.

Standards Approved for Pipe Nipples

WASHINGTON, July 10.—Commercial standards for steel and genuine wrought iron pipe nipples were approved here at a general conference on June 29 of manufacturers of pipe and pipe nipples, and distributers and users of pipe nipples. The meeting was held under the auspices of the commercial standards unit, Bureau of Standards. The approved commercial standards specify that pipe nipples shall be made only from tested new full or short lengths and full-weight steel pipe, free from buckles, bends, kinks, cracks, laminations, imperfect welds, rust, injurious sand marks or any other defects which might affect its strength or serviceability. For steel pipe nipples, the pipe shall otherwise conform in all respects to the American Society for Testing Materials tentative specification for welded and seamless steel pipe, while that for genuine wrought iron pipe nipples shall be in accordance with the A. S. T. M. specification for welded wrought iron pipe No. A72-27.

Effective date for new production and clearance of existing stocks, the conference agreed, should be Jan. 1, 1929. The commercial standards will be subject to annual review for revision by the standing committees. The conference voted unanimously for the adoption of the certification plan of the Bureau of Standards. Under this procedure, the manufacturer of the nipples will, upon request, certify to the purchaser that his commodity is made in conformity with the approved commercial standards.

I. J. Fairchild, head of the commercial standards unit, stated that, before printing the standard, signed acceptances must be received from at least 65 per cent (by volume) of the annual production, as well as a majority of distributers and users.

Freight Rates to Charleston, W. Va., Upheld

WASHINGTON, July 10.—Rates on manufactured iron and steel products, in carloads, from Cambridge, Ohio, and from the Pittsburgh, Youngstown, Johnstown, Pa., and Wheeling, W. Va., groups, to Charleston and Dunbar, W. Va., are not unreasonable, according to a proposed report made last week to the Interstate Commerce Commission by Examiner Thurston B. Johnston, in recommending dismissal of a complaint made against the rates by the Fletcher Enamel Co. and other makers of enamel ware at Charleston and Dunbar. Except from Cambridge and Johnstown the rates are 28.5c. per 100 lb., while from Cambridge and Johnstown they are 25.5c. and 30c. respectively. The complainants had asked for application of the Jones & Laughlin scale, which over short-distance routes ranges from 1.5c. to 6.5c. per 100 lb. less than the rates that are applied.

Keeping Busy the Continuing Need

The biggest problem confronting the nation, and one that will probably confront it for a long time, is that of keeping busy, says F. C. Biggert, Jr., president United Engineering & Foundry Co., Pittsburgh. "The loss of production, the discomfort and downright hardship of our recurring periods of slack operations, amounts to a tremendous total," he believes.

"We still have before us the development of many new products as well as the wider distribution of many already developed," he argues, "and as these developments occur, they will provide jobs for many who are from time to time displaced by new productive methods.

"We still have need for much road building. The development of our navigable waterways is barely begun. Flood prevention should be undertaken in many districts. Water power development should be advanced more rapidly than is now occurring. The Government should be spending much more than it now is upon aviation. Landing fields should be procured and equipped by the Government, instead of leaving this important matter to private and municipal enterprises. Air ways should be mapped and rights of way secured."

Heavier Freight Movement in Iron and Steel Forecast

WASHINGTON, July 10.—Transportation requirements for iron and steel traffic during the third quarter of the present year are estimated at 454,760 cars, or an increase of 4.8 per cent over the 433,823 cars required during the corresponding period of last year, according to reports received by the car service division of the American Railway Association from the 13 Shippers' Regional Advisory Boards. For the 29 principal commodities, 9,910,768 cars will be required, it is estimated, an increase of about 597,000 cars or 6.4 per cent above the third quarter of 1927. Of the 13 boards, only two, the Central Western and Ohio Valley, estimated decreased requirements. The total number of cars required for coal and coke is estimated at 2,820,897, an increase of 14.1 per cent; for ore and concentrates, 839,352, an increase of 2.7 per cent; for castings, machinery and boilers, 67,875, an increase of 3.2 per cent; for agricultural implements, 42,355, an increase of 8.7 per cent; for automobiles, trucks and parts, 244,510, an increase of 16 per cent, and for petroleum and petroleum products, 653,174, an increase of 10 per cent.

Chrysler Corporation Opens New Engineering Building

A new engineering building for the Chrysler Corporation was opened July 2 with an informal celebration attended by Detroit city officials, leaders in the automotive industry and others prominent in public, industrial and financial circles. The building, which is part of the Chrysler Highland Park plant group, was opened for public inspection on Wednesday, July 4.

Four stories high and containing 960,000 sq. ft. of floor space, the building is a complete motor car factory within itself, with facilities for every process of motor car designing, building and testing. In it the engineering department will design and build experimental cars and parts for all Chrysler products, which now comprise four lines of cars and a line of marine engines.

Civil service examinations are announced by the United States Civil Service Commission for associate and assistant civil engineers with initial salaries ranging from $2,600 to $3.700 a year. Applications must be on file with the commission at Washington not later than Aug. 15. Full information may be obtained from the commission or from the civil service board of examiners at the post office or custom house in any city.

Forecasts Large Manganese Ore Output This Year

The placing of calcined rhodochrosite on the market in 1927 indicates that the domestic production of manganese ore in 1928 will probably be materially increased, according to a statement issued by the United States Bureau of Mines, Washington, reporting on shipments of manganese for last year. Noting that there was relatively little change in the shipments of ore containing 35 per cent of manganese or more in 1927 compared with 1926, it was pointed out that a large part of the shipments from Montana, which showed an increase of 4400 gross tons, was calcined rhodochrosite. California, North Carolina and Washington, all of which shipped high-grade ore in 1926, made no shipments in 1927. Shipments of ore containing 35 per cent or more manganese totaled 44,741 tons in 1927, against 46,258 tons in 1926. Shipments of metallurgical ore totaled 27,730 tons. This was an increase of 1200 tons.

Shipments of ore containing 10 to 35 per cent of manganese were less than half as large as those in 1926, amounting to 148,291 tons, against 364,312 tons. The larger part of the decrease in shipments of this grade is accounted for by shipments in Michigan and Minnesota that were classed with ores containing over 10 per cent of manganese in 1926 and fell below 10 per cent in manganese content in 1927.

Shipments of ore containing 5 to 10 per cent of manganese amounted to 1,310,127 tons, valued at $3,270,560, in 1927, compared with 835,412 tons, valued at $1,934,381, in 1926, an increase in quantity of 474,715 tons.

Imports in 1927 totaled 622,067 tons, or 308,630 tons of contained manganese, valued at $8,487,016, compared with 347,378 tons of manganese content, valued at $11,071,131, in 1926, exclusive of 14,112 tons of ore imported from Cuba.

Coal Supplies for 36 Days

Coal stocks in industries in the United States on June 1 were estimated by the National Association of Purchasing Agents as equivalent to 36 days' supply. Industries varied widely in this respect, however. By-product coke plants had supplies for only 19 days, against 66 days for electric utilities and coal gas plants. The railroads were credited with 36 days' supply. steel mills with 39 days and other industries 35 days.

Tonnage on hand June 1 was estimated at 40,890,000, a drop of 2,780,000 tons from the May 1 figure. There has been a consistent decline in the total reported, ever since Oct. 1, when the aggregate was 60,154,000 tons. Consumption in industries in May is given as 34,844,000 tons, a slight drop from April and the smallest figure since last September.

Estimates of the National Coal Association place the amount of bituminous coal mined in the last week of June at 8,350,000 net tons. This is about equivalent to the average of the two preceding weeks, as reported by the United States Bureau of Mines.

Graphite Production Last Year

Sales of natural graphite by producers in 1927 amounted to 5207 net tons, valued at $232,971, a decrease of 263 tons, or 5 per cent in quantity, and an increase of $13,629, or 6 per cent, in value, compared with 1926, according to the Bureau of Mines, Department of Commerce. The bureau's statistics of production were collected in cooperation with the geological surveys of Alabama, Michigan and Texas.

The decrease in production last year was in the amorphous variety, the crystalline variety increasing both in quantity and value.

The manufacture of artificial graphite in New York decreased from 9448 net tons in 1926 to 5472 tons in 1927, or 42 per cent. Imports of graphite in 1927 amounted to 17,452 tons, valued at $723,923, compared with 16,166 tons, valued at $921,233 in 1926, an increase of 8 per cent in quantity, but a decrease of 21 per cent in value.

Sharp Drop in Shipments of Sheet-Metal Ware

WASHINGTON, July 9.—Shipments of galvanized sheet-metal ware in May are reported by the United States Department of Commerce at 190,704 dozens, valued at $758,953, compared with 237,511 dozens in April, valued at $875,442. The May total is the smallest since February. It compares with 163,287 dozens a year ago, with a value of $665,808. For the five months there has been a gain—from 988,727 dozens and $3,710,727 last year to 1,026,455 dozens, $3,877,143, this year.

Largest June Building Construction Ever Recorded

Building construction contracts placed in June are reported by F. W. Dodge Corporation at $650,466,000. This is the second largest total ever reported for one month, having been exceeded by about 2½ per cent in May of this year. It was 3 per cent ahead of the high record made in June, 1927, and far exceeds any other June. For the first six months of the year the total has been $3,445,000,000. This is the largest first half-year on record, representing an increase of 8 per cent over the first half of last year.

Residential buildings in June accounted for $258,084,000, or 40 per cent of the total. Public works and utilities amounted to $130,852,000, commercial buildings to $93,942,000 and industrial projects to $63,537,000. Contemplated new work reported in June amounted to $1,030,095,000, being 17 per cent ahead of May and 41 per cent above a year ago.

June contracts in New York and northern New Jersey were the largest for the month ever recorded, but were lower than in May. The same is true of the Middle Atlantic States and of Texas. In the Southeastern States the June total ran ahead of May. In New England, the Pittsburgh district and the Central West June made the second highest showing ever reported for that month.

Estimates of the Associated General Contractors of America placed the June volume of construction at 244, on a basis of 100 as the average for 1913. The current figure is contrasted with 212 in June last year and with a previous high total of 238 in August last year. The figure for May was 185.

Gain in Locomotive Shipments

WASHINGTON, July 9.—Railroad locomotives to the number of 51 were shipped in June, against 41 in May, according to the Department of Commerce. Of the June shipments, 39 were steam and 11 were electric locomotives for domestic account. One steam unit was shipped abroad. For the six months ended with June 314 locomotives were shipped, compared with 570 for the corresponding period of last year. In June, 1927, the total number was 89.

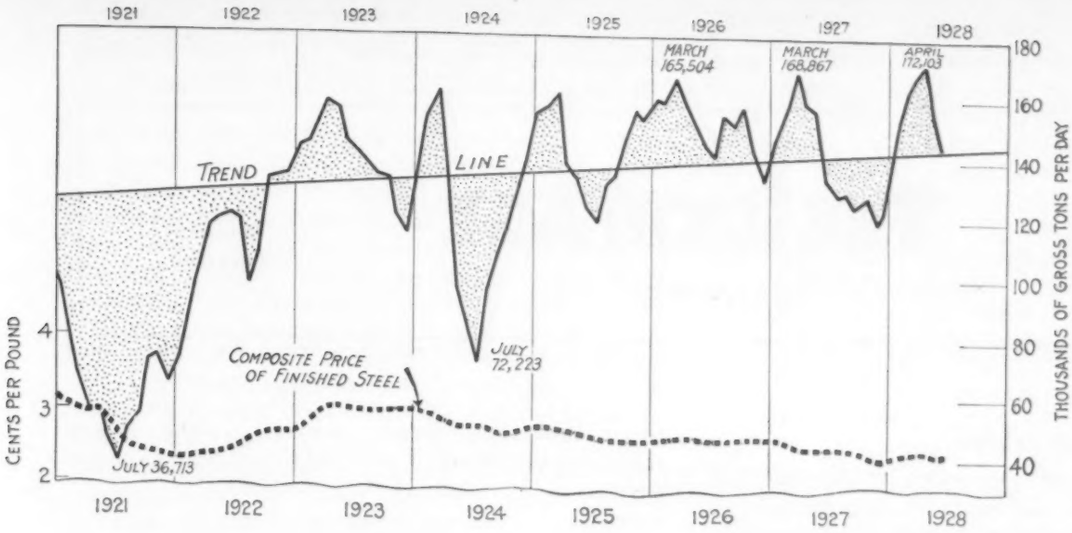
Unfilled orders July 1 called for 201 locomotives, compared with 220 on June 1 and with 400 a year ago. Of the current unfilled orders 161 are for steam and 40 for electric units. Foreign buyers account for 52 and three respectively.

Steel Works Employment Almost Stationary

Employment in 196 establishments making iron and steel total 265,197 in May, compared with 265,713 in the same establishments in April. The reduction was 0.2 per cent. There was an increase of 2.4 per cent in the total amount of payroll, the advance being from $8,275,366 to $8,471,115 for corresponding weeks in the two months.

Meantime 996 establishments in the foundry and machine shop group showed an advance from 233,951 on the payroll in April to 238,290 in May—an increase of 1.9 per cent. The amount on the payroll went up correspondingly from $7,017,127 to $7,205,634, or 2 per cent.

Machine tool plants to the number of 153 showed an increase of 2.7 per cent in number on payroll and 2.5 per cent in amount of payroll. Structural ironwork advanced 3.7 per cent in number on payroll and 6.1 per cent in amount of payroll, while cast iron pipe plants advanced 3.1 per cent under both heads.



While Dropping to the Lowest Daily Rate of the Year, Production of Steel Ingots in June Carried the Half-Year to a New High Record. Prices, as measured by THE IRON AGE *finished steel composite price, were slightly better in June*

Ingot Production Makes New Record

First Half 639,000 Tons Ahead of Previous Highest Half-Year— Gain Over 1927 Almost 1,000,000 Tons

PRODUCTION of open-hearth and Bessemer steel ingots in the United States in June is calculated by the American Iron and Steel Institute at 3,742,964 gross tons. While this is the smallest total for any month of the year as yet, it is greater than the production of any month in 1927 subsequent to May. The six-month total is calculated at 24,792,883 tons, against 23,807,387 tons for the first half of 1927.

Previous to this year, the highest output for any half-year was that of the first half of 1926, at 24,153,809 tons. That figure included crucible and electric steel ingots, which are not included in the current figure. Hence, the apparent increase of 639,074 tons over the previous record becomes considerably greater if allowance be made for the tonnage no longer reported. As that class of ingots in 1927 aggregated 378,974 tons, it may be fair to allocate 190,000 tons of crucible and electric steel ingots to the first half of this year, thus making the total about 24,983,000 tons, which is 829,000 tons (or 3½ per cent) higher than the previous record.

On the daily basis, the June production in 26 working days was 143,960 tons a day. This shows a drop of about 8 per cent from the figure for May and about 17 per cent from the high record figure of April. For the six months, the average for 156 working days was some 5300 tons greater than the average for the first six months of 1927, which had only 155 working days.

Practically the entire gain in six months over last year was in the open-hearth classification. Disregarding the tonnage of the small proportion of companies not reporting, the total was 20,213,141 tons, or close to 1,000,000 tons above the 19,226,735 tons of last year. Bessemer ingots, on the other hand, showed a drop of 50,000 tons, or 1½ per cent.

Estimating production in June of electric and crucible steel ingots at 1400 tons a day, the total for the month appears to have been about 145,360 tons for each working day.

Production of Steel Ingots*

(Gross Tons)

Months 1928	Reported by Companies Which Made 94.68 Per Cent of the Steel Ingots in 1927		Calculated Monthly Output All Companies	Approximate Daily Output All Companies
	Open-Hearth	Bessemer		
Jan.	3,280,247	498,746	3,991,332	153,513
Feb.	3,308,728	521,366	4,045,304	161,812
March	3,700,411	567,309	4,507,520	166,945
April	3,509,637	564,039	4,302,573	172,103
May	3,397,631	581,949	4,203,190	155,674
June	3,016,487	527,351	3,742,964	143,960
6 Months	20,213,141	3,260,760	24,792,883	158,929
1927				
Jan.	3,042,133	545,596	3,789,874	145,764
Feb.	3,043,492	565,226	3,812,046	158,835
March	3,702,660	590,709	4,535,272	167,973
April	3,341,750	565,440	4,127,335	158,744
May	3,273,593	557,785	4,047,251	155,663
June	2,823,107	486,053	3,495,609	134,446
6 Months	19,226,735	3,310,809	23,807,387	153,596
July	2,596,349	436,883	3,204,135	128,165
Aug.	2,806,347	505,596	3,498,549	129,576
Sept.	2,622,977	471,548	3,268,881	125,726
Oct.	2,643,562	495,845	3,316,292	127,550
Nov.	2,478,627	481,599	3,127,015	120,270
Dec.	2,557,955	448,154	3,175,484	122,134
Total	34,932,552	6,150,434	43,397,743	139,543

*Excluding crucible and electric steel ingots.

Present Clock to Louvain University

Formal presentation to the University of Louvain of a clock and carillon for the tower of the new library was made July 4 by the War Memorial Committee of American Engineers. The ceremony took place in connection with the dedication of the library. The address of presentation was handed to the secretary of the university, Leon Van der Essen, by Dr. Edward Dean Adams, New York, committee chairman and representative of the Engineering Foundation.

The address recited in part: "To the glory of God and in memory of their fellow engineers who died in service during the Great War 1914-1918, the engineering societies of the United States of America present to the University of Louvain the carillon and the clock installed in the tower of the library of the university, the endowment fund of $10,000 for their maintenance, the honor roll of those who died, and a record of the names of all those whose contributions have made this memorial possible."

A. I. FINDLEY
Editor

THE IRON AGE

W. W. MACON
Managing Editor

ESTABLISHED 1855

Testing the "Graham Idea"

IN a mechanical age the importance of the individual is overlooked. We give credit to mass production, to system, to scientific management, to standardization, or to some other abstract concept, but frequently forget our dependence, in the last resort, on human qualities.

As pointed out by Magnus W. Alexander in an address abstracted elsewhere in this issue, production is outstripping consumption in certain lines, and a distribution problem has arisen. Among makers of steel products distribution has been a topic of discussion for several years, but for the most part efforts to find a solution have stopped with general pleas for cooperation.

It remained for Charles J. Graham and other manufacturers of bolts, nuts and rivets to make the first systematic and sustained study of distribution in the steel industry. While their pioneer work has covered only a part of the iron and steel field, it has dealt with a branch having one of the most complex distributing organizations.

Mr. Graham and his associates have traveled from coast to coast at their own expense, and have done much to create a new conception of distribution and to bring about accord, where distrust and unintelligent competition had existed before. They have tried to instill into manufacturers and jobbers alike a sense of responsibility to each other, in the face of ingrained habits of individualism.

What they have attempted is not comparable with the purposes of the price pools of former days. The pools were frankly intended as a means of raising prices and thereby increasing profits. Today, mass production calls for mass demand, and it is realized that high prices mean idle plant and equipment. In fact, the present tendency to overproduce has created a new need—that of preventing prices from going to ruinously low levels.

It was to find a way, within the law, to throw the brakes on falling prices, and not to raise them, that the bolt, nut and rivet industry undertook to reorganize its distribution. If what has been done does not stand the test of time, it will be because the many independent business units involved are not yet capable of group thinking. It is obvious that the economic security of the individual depends on the stability of the entire industry; but a more short-sighted selfishness, taking into account immediate gain only, may prevail.

The plan adopted for bolts, nuts and rivets, which will be extended to other iron and steel products if the recent New York distribution conference bears fruit, is a test of men rather than of principles. It will succeed only if those called upon to cooperate for the common good have the vision of those who initiated the movement.

A Record Half-Year

NOT only has the production of steel ingots made a new high record in the half-year just ended, but building construction has scaled new heights and the output of automobiles, after a slow start, has exceeded that of all half-years save the first half of 1926. Ingots, after making allowance for the crucible and electric steel tonnage, no longer reported by months, topped the 1926 record of 24,153,809 tons by about 850,000 tons, or 3½ per cent. New building construction, at $3,445 millions, was 8 per cent ahead of last year, with June running up the highest total ever recorded. Automobile production (United States only) was about 2,200,000 cars and trucks. This is 150,000 less than in the first half of 1926, but 50,000 more than in any other half-year.

Railroad traffic does not hold up to some previous records. Car loadings and tonnage moved are not impressive, as compared with the figures for 1926. But the story of activity told by the figures for steel and automobile and building operations quite warrants the common observation that "business has been good," in spite of the qualification often made of the inadequacy of profits.

Bessemer Steel in the Market

THAT Bessemer steel is superior to open-hearth steel for a variety of purposes was pointed out in an article in last week's IRON AGE by Dr. G. B. Waterhouse, professor of metallurgy at the Massachusetts Institute of Technology and consulting engineer and metallurgist. The merits of the two steels were considered from the technical aspect, and it was pointed out that, in addition to the fact that Bessemer steel, as now made, is preferable for certain uses, there are opportunities to improve the quality further.

Two other phases of the subject may be considered —marketing and cost. Using for illustration Doctor Waterhouse's reference to the superiority of Bessemer steel for high-speed automatic screw stock, that is a specific use involving large tonnages, and the consumers call for Bessemer steel in making their purchases. A large tonnage of merchant bars is sold without the producer knowing just how the bars are going to be used. Some will be used one way, some another. In a general way open-hearth would cover all the uses,

while in some of them, perhaps only a small proportion, there would be objections to Bessemer. Accordingly the seller, when he is a maker of both Bessemer and open-hearth, elects to ship open-hearth. This is not theory, but citation of the practice under which much steel is being sold at the present time. Then, too, there are many buyers who have heard things about steel in a general way and have been moved to ask for open-hearth without definite knowledge that it would be more suitable for their purpose than Bessemer.

If the manufacturers wished to push Bessemer steel they would have much ground in which to work. There was a time, years ago, when open-hearth steel promised to be considerably cheaper to make than Bessemer. Events have worked out differently. Construction costs have mounted enormously and that falls more heavily upon open-hearth than upon Bessemer, and the increase in wages operates in the same direction. At one time there was an expectation that the relation of Bessemer and non-Bessemer ore supplies would become such as to make the former much the dearer; but additional discoveries of ore and the decline in consumption have made a condition today quite different from that expected a quarter century ago, when production of Bessemer steel was still showing increases.

It is true there is an argument in the other direction, scrap being cheaper now in relation to pig iron than it used to be. Using composites of THE IRON AGE for comparison, heavy melting steel against all descriptions of pig iron, scrap averaged $2.12 under pig iron in 1912-13-14 and $4.74 under in 1926-27. But scrap costs money to gather and transport while ore, coke and pig iron still have opportunities for cost reduction.

Steel makers have been making much progress in linking their various products with the services to which they will be put. It would seem that there is a good outlook for improving Bessemer steel and pushing it into the numerous uses for which it is particularly well fitted, with an advantage to the producer in the matter of cost.

Canada and American Steel

CANADIAN steel manufacturers continue to stress the existing regime of low or moderate duties on their products as a bar to the prosperity they have hoped for year by year but have not realized. President Robert Dodd of the Lake Superior Corporation, which has spent largely for plant extensions at Sault Ste Marie, Ont., in the past few years, complains that American steel companies, "protected by almost prohibitive duties on steel, can afford to sell their product in Canada at a price below production costs in this country" and adds that higher Canadian import duties would prevent this. To the suggestion that in case steel duties were raised American producers would build plants on the Canadian side, he replied that then they would be on a footing with Canadian steel works and their operations would benefit the Dominion in increased employment and in other ways.

It is quite improbable that American steel interests would build works in Canada, even though the Dominion Government raised steel tariff schedules. Canada is too largely agricultural and its urban population gives altogether too little promise of development in the American way to warrant any such move. Also the hazard of a sudden electoral reversal of any policy of encouragment to steel manufacture is too great.

As THE IRON AGE has suggested on other occasions, no large part of the steel business our manufacturers have in Canada is done at the expense of the Canadian industry, and little if any of it at prices below production costs in Canada. The administration of Canada's anti-dumping laws is too efficient to permit this last, even if producers here ever reached such a degree of demoralization in their selling.

On the basis of last year's operations, Canadian steel works produced roundly 700,000 tons of rolled steel for their home market. Exports of American steel, finished and semi-finished, to Canada are also not far from 700,000 tons. While there is competition between works here and works yonder on certain products, a large part of the shipments from this side is in finished forms which Canadian mills are not equipped to manufacture. Canada, with her limited consumption of many rolled products, does not warrant the building of mills devoted to these lines or of mills equipped to roll the great variety of sizes and shapes which has been made available in this country only by investments running into hundreds of millions. Therefore, for years to come our Canadian neighbors will continue to avail themselves of the unparallelled facilities of American works and at prices which need neither threaten the prosperity of their own steel companies nor put the manufacturing consumer there at any disadvantage in comparison with his competitor on this side of the line.

British Blast Furnace Practice

BRITISH blast furnaces use considerably more iron ore and coke than American furnaces to make a ton of pig iron, but nevertheless they get along with a little less limestone, the native ores being somewhat self fluxing. Statistics of the consumption in 1926 are given in the annual report issued this year by the National Federation of Iron and Steel Manufacturers. A comparison with the blast furnaces of the United States, for the same year, is given below:

Materials Consumed per Ton of Pig Iron—1926

	Britain	United States
Iron ore, gross tons.....	2.3245	1.763
Cinder, scrap, etc.....	0.1715	0.165
Total, gross tons.....	2.4960	1.928
Limestone, pounds.....	878	889
Coke and coal, pounds....	2950	2061

The figures are closely comparable. While 1926 was an off year in British pig iron production, on account of the coal strike, the proportions of material did not vary materially from the average, except for a slight diminution in coal and coke consumption. The British average includes ferroalloys while the United States average excludes them.

It might be thought that the fact that the American industry has been a rapidly expanding one would in itself conduce to the making of improvements, there being so much opportunity in the designing of new plants. This does not apply with so much force to blast furnaces as to other things, for in both Great Britain and the United States the number of blast furnaces has been decreasing, for forty-seven years in the United States and for a longer time in Great Britain. In a British record beginning with 1874

that year is assigned the largest average number of furnaces in blast, 649, there being a substantially steady decrease to date. The United States record, which deals with the number of furnaces in existence, shows 716 in 1881, and decreasing numbers thereafter. At the end of 1927 there were 351 coke furnaces counted as capable of operation (though only 169 were then operating) and thirteen charcoal furnaces.

The early American blast furnaces had much less output per stack than the British. They were charcoal furnaces, but the nature of the fuel was not the reason. Rather it was a matter of geography and transportation, stacks being set up at numerous points where wood and iron ore were available. While American outputs have greatly outdistanced the British, the average being three or four times as great, there has been a certain increase in Great Britain, particularly in the last ten years. The following table shows the average number of British furnaces in blast at decennial periods, with the average annual output in gross tons.

British Blast Furnaces by Decades from 1877

	Number in Blast	Annual Output, Gross Tons
1877	541	12,200
1887	405	18,700
1897	380	23,200
1907	369	27,400
1917	318	29,400
1927	171	42,500

Of course it is chiefly a case of the fitter, and larger, stacks surviving and being in blast, and that is exactly the experience in the United States.

RAILROAD buying gives little promise of amounting to much in the next few months, from all that came out of the railroad equipment show at Atlantic City. Disappointing as this situation is to those largely dependent on railroad business, the iron, steel and metal-working industries have been enjoying, on the whole, a surprisingly good volume of demand with so little help from the railroads. There is nothing in general conditions to suggest any marked revision of the steel buying schedules maintained lately, and business accordingly is now looking upon any expansion in the calls from the carriers as just so much to be added to a fairly satisfactory running total. Since the Atlantic City gathering, one reassuring development is the appearance this week of four inquiries for steel rails, on top of regular purchases long since closed, and some of the new rails will be put into track this fall.

THE New York *Times*, whose standard of accuracy, which it does not emphasize, is generally as high as its standard of cleanness, which it does emphasize, had this in an editorial a day or two ago:

> Perhaps the phrase is not to be found in the work on agriculture which Secretary Hoover translated from the Latin. . . .

All the "agriculture" in *De Re Metallica*, which Mr. and Mrs. Hoover translated from the Latin, was in the name of its German author, Agricola. While eminently a "dirt" mining engineer, we believe the Secretary has made no claim to recognition as either a theoretical or a dirt agriculturist.

Export Information Developed by Research as an Aid to Foreign Business

Research as applied to export trade and the possibilities for expanding it can furnish information, definite and precise in many cases, along several lines of attack on the problem. As pointed out in a brochure prepared for the Research Committee of the New England Council by the Policyholders' Service Bureau of the Metropolitan Life Insurance Co., New York, some of these items are:

What can be sold.
Where it can be sold.
Extent of the possible market.
What it costs to do business.
How many buyers there are.
When they make their purchases.
What are the best methods to use in getting business.

Personal investigation is urged as highly desirable in carrying on such a research. Sending to the country in question a representative—preferably from the factory—who can talk the language of the prospective customers is said to be the best means of obtaining a foothold in the desired market. Frequently such a trip is made, not with the hope of getting immediate business, but to secure first-hand knowledge of the far-away markets. Personal study of local conditions is thus utilized as a background in extending or inaugurating business connections.

All of this is, of course, in addition to the data and advice obtainable from the United States Department of Commerce. Many times this organization can tell a manufacturer whether it would be likely to be profitable for him to spend his time and money in looking carefully into the proposed outlet for his goods.

Foreign credit conditions often provide a stumbling block unless the subject is studied exhaustively, along the lines of local practices. With such a careful survey it is found that losses from this source may be held within 1 per cent, or even less. In some instances these losses prove lower than those from domestic customers.

Thoroughness, personal knowledge of the field, trust in the dealer abroad and complete sales information by classes of lines are four points stressed as essential to success in developing foreign markets. Complete dealer information, a branch of the fourth item, is needed, also, so that, while there is no effort to coerce dealers, the company is in a position to know what may reasonably be required of them.

To Further the Use of Slag

Manufacture and use of slag products are covered in a 56-page pamphlet issued by the National Slag Association, Leader Building, Cleveland. This is the fourth in a series of monographs, the others having been "Absorption in Slag and Slag Concrete," "Resistance of Blast Furnace Slag to Abrasion and Wear" and "Action of Slag Under High Temperatures and Fire." Primarily the present pamphlet discusses articles made of cement in which the slag is the principal ingredient. Concrete blocks and brick, monuments and a wide variety of other forms are treated, as well as similar articles made from slag-lime combinations, the hydrated lime acting as binder. This process has been employed more extensively in Europe than in the United States, as both the British and the Germans have experimented thoroughly with such products and their manufacture in France is being carried on on a large scale.

Construction costs in June are placed at 198 (1913 average at 100) by the Associated General Contractors of America. Comparing with 196 in May, this is the first rise since September.

This Issue in Brief

Some legal way must be found to control production within reasonable bounds, says G. M. Verity. Mass production methods normally tend to result in surplus output, which means shrinking profits. Industrial executives should make up their minds to accept the fact that it is economically impossible to get what might be termed a high price for a product manufactured on a mass-production basis. —Page 89.

* * *

Die casting may pay, even if the number of parts to be made does not exceed one thousand. It all depends on the amount of costly machining and finishing operations the die casting eliminates.—Page 82.

* * *

Human factor can be removed from reversing valves in open-hearth furnaces by using pyrometer controllers. Thermo-couples can be located at a relatively cool spot in the rear of the checker work, and when temperature reaches the mark at which the spotter on each controller is set, the draft is automatically reversed.—Page 77.

* * *

Arc welding operator's performance is checked by recording shunt ammeter. The character of curves shows the type of work done, when polarity has been reversed, if electrode has been grounded, whether the work has been rushed, etc.—Page 77.

* * *

Is the "Graham idea" the cure for ailing industries? If it fails it will be because the many independent business units involved are not yet capable of group thinking, says IRON AGE editorial writer.—Page 96.

* * *

Steel ingot output establishes new half-year record. Production for six months was 24,792,883 tons, exceeding by 639,000 tons the previous record, made in 1926. June daily output averaged 143,960 tons, 7.5 per cent under May.—Page 95.

Rusting of sheets in storage is prevented by use of recording psychrometer. If record shows atmospheric conditions are favorable to formation of dew, fans are started to circulate warm air throughout the warehouse, preventing moisture from collecting on the sheets.—Page 77.

* * *

Doubts that machinery will be a serious contributor to unemployment. While machinery eliminates much of the less desirable kinds of work, says steel manufacturer, it substitutes jobs of a higher order. Temporary displacements in some particular line will be compensated for by opening of new channels and widening of old ones.—Page 89.

* * *

Even distribution of heat in annealing furnace is obtained by means of "double pass" combustion chambers. Oil and air are mixed in the lower chamber; gases then travel to the upper pass and are admitted to the working chamber through ports dimensioned to provide for proper heat distribution.—Page 80.

* * *

Ford prefers electric furnaces for heat-treating. Low-cost power is plentiful and, though first cost of furnaces is high, ease of control, cleanliness, compactness and non-radiating qualities recommend them. Nickel-chromium in ribbon form is used as a resistor where temperature does not exceed 1500 deg. Fahr.—Page 73.

* * *

"Friction bite" hoist mechanism avoids the use of limit switches on electrode arms in melting furnace. Electrodes are counter-balanced and operating mechanism is equipped throughout with anti-friction bearings. Electrode arms are fastened to one end of a steel cable, which passes over sheaves and around a fiber sleeve on a winch drum and then up to a counterweight.—Page 79.

Insulating open-hearth regenerators will pay for itself within a few months, says insulator manufacturer. Calculates that heat saved equals $53 per 100 sq. ft. a year. Where insulation is properly proportioned to conditions, highly desirable results are obtained, without detriment to the brickwork.—Page 86.

* * *

High cost of distribution is reflected in the lower percentage of wage earners engaged in productive, as distinguished from distribution, work. In 1870, 88 per cent of those gainfully employed were engaged in production, while now less than 70 per cent are so employed.—Page 83.

* * *

Denies post-war gain in world iron output is below pre-war average. Gains since 1919 will be found to approximate 12-year pre-war trend, says IRON AGE staff writer. "Nothing less than another devastating war will prevent the steady expansion in output called for by the post-war trend," he believes.—Page 81.

* * *

New record for June building construction was established last month. Contracts totaled over 650 million dollars, second largest month on record, and 3 per cent over those of June last year. First half-year was the highest ever reached.—Page 94.

* * *

"Keeping busy," says machinery builder, "is nation's biggest problem and will continue to be for a long time." Loss of production, discomfort and downright hardship in recurring periods of slack operation amount to a tremendous total. —Page 93.

* * *

If you injure another industry by selling below cost you yourself will be adversely affected eventually. Business is interdependent, says head of Industrial Conference Board, and selling part of output at a loss is bound to react disastrously upon the seller.—Page 83.

Pig Iron Output in June Declines

Actual Data Make the Daily Rate 3198 Tons or 3 Per Cent Less Than May—Net Loss of Nine Furnaces

ACTUAL data covering the operations of blast furnaces in June show almost no change from the estimates published in THE IRON AGE, July 5. The June production was 102,733 tons per day or only 23 tons per day more than the estimate of 102,710 tons published last week.

Total June coke pig iron output was 3,082,000 gross tons or 102,733 tons per day for the 30 days in June compared with 3,283,856 tons or 105,931 tons per day for the 31 days in May. This is a decrease of 3198 tons or 3 per cent for June. In May there was a slight loss of only 0.25 per cent from April. The June production last year was 3,089,651 tons or 102,988 tons per day so that the two months show little variation. Output last month was the smallest for June since June, 1925, when it was 89,115 tons per day.

The Half Year's Production

Production for the half year to July 1 was 18,520,921 tons which is the smallest for that period since 1924 when the output to July 1 was 17,434,492 tons. The record for the first half year was 20,841,530 tons in 1923. An interesting fact is that the merchant iron production, which was about 21,100 tons per day to July 1, this year, or close to 21 per cent of the total daily rate, compares with about 27,400 tons per day or nearly 24 per cent of the total daily rate for the first half of 1923, the record year.

Large Ferromanganese Output

Ferromanganese produced last month was 32,088 tons or the largest since separate records have been published.

Capacity Active on July 1

On July 1 there were 189 furnaces active having an estimated daily operating rate of 100,855 tons as compared with an operating rate of 106,145 tons per day for the 198 furnaces blowing on June 1. Six furnaces were blown in and 15 were shut down during June, a net loss of nine. Of the furnaces blown in two were Steel Corporation stacks, one belonged to an independent steel company and three were merchant furnaces. The Steel Corporation shut down seven furnaces and the independent steel companies blew

Daily Average Production of Coke Pig Iron in the United States by Months Since Jan. 1, 1924—Gross Tons

	1924	1925	1926	1927	1928
Jan.	97,384	108,720	106,974	100,123	92,573
Feb.	106,026	114,791	104,408	105,024	100,004
Mar.	111,809	114,975	111,032	112,366	103,215
Apr.	107,781	108,632	115,004	114,074	106,183
May	84,358	94,542	112,304	109,385	105,931
June	67,541	89,115	107,844	102,988	102,733
½ year	95,794	105,039	109,660	107,351	101,763
July	57,577	85,936	103,978	95,199	.....
Aug.	60,875	87,241	103,241	95,073	.....
Sept.	68,442	90,873	104,543	92,498	.....
Oct.	79,907	97,528	107,553	89,810	.....
Nov.	83,656	100,767	107,890	88,279	.....
Dec.	95,539	104,853	99,712	86,960	.....
Year	85,075	99,735	107,043	99,266	.....

Pig Iron Production by Districts, Gross Tons

	June (30 days)	May (31 days)	April (30 days)	March (31 days)
New York and Mass.	199,045	212,333	205,556	216,224
Lehigh Valley	60,640	77,195	81,140	80,058
Schuylkill Valley	52,434	53,162	60,062	51,325
Lower Susq. and Lebanon Valleys	29,207	32,019	31,522	33,301
Pittsburgh district	606,223	700,880	663,784	639,693
Shenango Valley	101,543	114,779	100,073	101,946
Western Pennsylvania	117,833	126,790	116,405	101,365
Maryland, Va. and Ky.	116,691	100,508	102,678	103,857
Wheeling district	145,717	124,948	115,284	133,764
Mahoning Valley	291,174	309,842	310,227	296,491
Central and North'n Ohio	349,952	357,900	336,200	330,176
Southern Ohio	40,810	26,380	25,548	25,729
Illinois and Indiana	635,201	694,636	693,271	715,439
Mich., Minn., Mo., Wis., Colo. and Utah	127,085	137,987	134,163	139,101
Alabama	200,643	207,045	199,487	223,314
Tennessee	7,802	7,452	10,104	7,891
Total	3,082,000	3,283,856	3,185,504	3,199,674

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works Iron	Merchants* Iron	Total
June, 1927	78,110	24,878	102,988
July	69,778	25,421	95,199
August	71,413	23,660	95,073
September	69,673	22,825	92,498
October	66,991	22,819	89,810
November	64,600	23,679	88,279
December	64,118	22,742	86,960
January, 1928	69,520	23,053	92,573
February	78,444	21,560	100,004
March	83,489	19,726	103,215
April	85,183	21,000	106,183
May	85,576	20,355	105,931
June	81,630	21,103	102,733

*Includes pig iron made for the market by steel companies.

Coke Furnaces in Blast

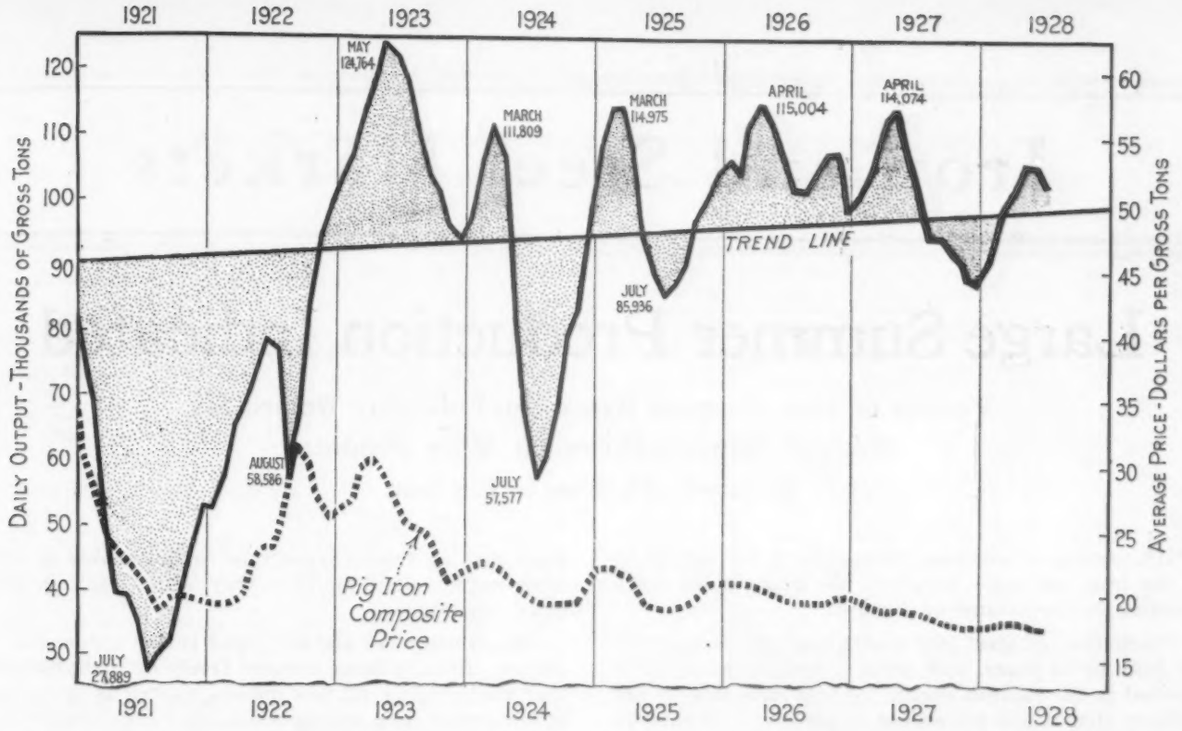
Furnaces	July 1 Number in Blast	July 1 Capacity per Day	June 1 Number in Blast	June 1 Capacity per Day
New York:				
Buffalo	11	5,580	12	5,700
Other N. Y. and Mass.	2	800	2	870
New Jersey	..	....	0	....
Pennsylvania:				
Lehigh Valley	5	1,930*	5	2,490*
Schuylkill Valley	4	1,750	4	1,710
Susquehanna Valley	2	975	2	1,020
Ferromanganese	0	....	0	....
Lebanon Valley	..	....	0	....
Ferromanganese	1	80	0	....
Pittsburgh District	31	19,485	36	22,000
Ferromanganese	3	500	3	530
Shenango Valley	6	3,300	7	3,700
Western Pennsylvania	6	3,530	6	3,795
Ferromanganese	2	390	2	290
Maryland	5	2,600	5	2,590
Wheeling District	8	4,860	8	4,400
Ohio:				
Mahoning Valley	17	9,700	17	9,735
Central and Northern	20	12,300	19	11,500
Southern	4	1,360	4	1,200
Illinois and Indiana	29	19,780	33	22,200
Mich., Wis. and Minn.	6	2,665	6	2,680
Colo., Mo. and Utah	4	1,575	4	1,765
The South:				
Virginia	1	230	1	230
Ferromanganese	1	80	1	80
Kentucky	2	725	1	345
Alabama	16	6,320	17	6,775
Ferromanganese	1	80	1	100
Tennessee	2	260	2	240
Total	189	100,855	198	106,145

*Includes spiegeleisen.

Production of Coke Pig Iron in United States by Months, Beginning Jan. 1, 1926—Gross Tons

	1926	1927	1928
Jan.	3,316,201	3,103,820	2,869,761
Feb.	2,923,415	2,940,679	2,900,126
Mar.	3,441,986	3,483,362	3,199,674
Apr.	3,450,122	3,422,226	3,185,504
May	3,481,428	3,390,940	3,283,856
June	3,235,309	3,089,651	3,082,000
½ year	19,848,461	19,430,678	18,520,921
July	3,223,338	2,951,160	.....
Aug.	3,200,479	2,947,276	.....
Sept.	3,136,293	2,774,949	.....
Oct.	3,334,132	2,784,112	.....
Nov.	3,236,707	2,648,376	.....
Dec.	3,091,060	2,695,755	.....
Year*	39,070,470	36,232,306	.....

*These totals do not include charcoal pig iron. The 1927 production of this iron was 164,569 tons.



Daily Pig Iron Output in June Was About 3 Per Cent Less Than in May; Composite Price Decreases Slightly

Inclined line represents the gradually increasing theoretical needs of the country, ascertained by a balancing of the ups and downs in production. It shows an average yearly increase in consumption of about 415,000 tons

out four. There were also four merchant stacks shut down. These data show a net loss of eight steel-making furnaces and one merchant furnace.

Possibly Active Furnaces Reduced

The Musconetcong furnace of the Musconetcong Iron Works in New Jersey and the Allen's Creek stack of the Tennessee Products Corporation in Tennessee have been abondoned during the last month, while the Tennessee Coal, Iron & Railroad Co. has blown in its new No. 5 Fairfield furnace in Alabama. This reduces the number of possibly active blast furnaces in the United States from 343 to 342.

Furnaces Blown In and Out

Furnaces blown in during May were the following: No. 2 Palmerton furnace of the New Jersey Zinc Co. in the Lehigh Valley; the Sheridan stack of the Lavino Furnace Co. in the Lebanon Valley; one Sparrows Point furnace of the Bethlehem Steel Corporation in Maryland; the Norton furnace in Kentucky (blown in the previous month but not reported); one Lorain furnace of the National Tube Co. in northern Ohio, and the Fairfield furnace in Alabama.

During the month the following furnaces were blown out or banked: One Susquehanna stack of the Hanna Furnace Co. in the Buffalo district; one Bethlehem furnace of the Bethlehem Steel Corporation in the Lehigh Valley; one Eliza furnace of the Jones & Laughlin Steel Corporation and one Carrie, one Clairton, one Duquesne and one Edgar Thomson furnace of the Carnegie Steel Co. in the Pittsburgh district; the Sharpsville furnace in the Shenango Valley; one Sparrows Point stack of the Bethlehem Steel Corporation in Maryland; one Granite City furnace of the St. Louis Gas & Coke Corporation in Illinois; one South Chicago and two Gary furnaces of the Illinois Steel Co. in the Chicago district; one Pioneer furnace of the Republic Iron & Steel Co. and the Alabama City furnace of the Gulf States Steel Co. in Alabama.

Production of Steel Companies for Own Use—Gross Tons

	Total Iron Spiegel and Ferro		Spiegeleisen and Ferromanganese*			
			1927		1928	
	1927	1928	Fe-Mn	Spiegel	Fe-Mn	Spiegel
Jan.	2,343,881	2,155,133	31,844	7,486	22,298	†
Feb.	2,256,651	2,274,880	24,560	7,045	19,320	†
Mar.	2,675,417	2,588,158	27,834	7,650	27,912	†
Apr.	2,637,919	2,555,500	24,735	12,907	18,405	†
May	2,619,078	2,652,872	28,734	9,788	29,940	†
June	2,343,409	2,448,905	29,232	10,535	32,088	†
½ year	14,876,355	14,675,448	166,939	55,411	149,963	†
July	2,163,101	.....	26,394	9,350	....	....
Aug.	2,213,815	.....	21,279	9,104	....	....
Sept.	2,090,200	.....	20,675	6,037	....	....
Oct.	2,076,722	.....	17,710	6,129	....	....
Nov.	1,933,043	.....	17,851	6,521	....	....
Dec.	1,987,652	.....	20,992	6,816	....	....
Year	27,345,888	.....	291,840	99,368	....	....

*Includes output of merchant furnaces.
†Data not available for publication.

Roller Bearings in Four-High Mills

In a paper on four-high mills, read before the Engineers' Society of Western Pennsylvania, F. C. Biggert, Jr., United Engineering & Foundry Co., Pittsburgh, touched on the roller bearings in such mills. The following are extracts from the paper:

"The roller bearing is thus the crux of the situation. It operates substantially without heat or wear and is particularly adapted to high speed. The only difficulty is that its dimensions precluded its use in ordinary two or three-high mills except under comparatively light rolling loads.

"This difficulty has been removed by using four-high mills where roll diameters may be selected without regard to any factor except the space requirements of the roller bearing. It was the perfection of this combination that started the recent and remarkable change from the long established practice for producing wide thin metal products.

"In a cold mill and at the finishing end of a hot mill where the power requirement is greatest, the saving, due to the four-high roller bearing mill, is approximately 50 per cent, that is, equal tonnages of like sizes, rolled from like slabs, require about one-half the power in a four-high roller bearing mill as would be required in a two-high mill on ordinary bearings.

"At the roughing end of a hot mill, where the metal is thick, this ratio probably does not apply, but the saving in power is substantial there also."

Iron and Steel Markets

Large Summer Production Indicated

Volume of Steel Business Keeps Up, Following Record Six Months' Output—Prices on Wire Products Reduced—Declines in Pig Iron

THE coming of summer, frequently a dull period in the iron and steel industry, has brought no sharp reduction in the volume of demand.

Production of steel last month was the largest for any June in 10 years, and, while a decline in output is expected in the current month, leading steel makers are confident that it will not exceed 10 per cent. In support of their forecast is the June increase of 220,187 tons in the unfilled orders of the Steel Corporation, the first gain since February. While part of this increase may have been due to recent pipe line orders and to tin plate contracting, it must also reflect more general covering in other products than recent reports indicated.

The buoyancy of demand is all the more noteworthy because it follows six months of record steel production. Output in that period not only exceeded production in the first half of last year, but was 3½ per cent higher than the previous peak, reached in the first six months of 1926.

Although consumption remains high—and leaders in the trade expect it to be well sustained, even without any expansion in railroad equipment buying—the price situation shows fresh evidence of instability. Foundry grades of pig iron at Chicago and at Philadelphia have been reduced 50c. a ton, and the scrap market is generally weak.

Among some finished steel products, also, prices are giving ground. Makers of wire products have announced a reduction of $2 a ton on nails, staples and plain wire and $3 on barbed wire. On nails and staples, however, the new quotations are essentially a formal recognition of prices that certain mills have been naming for some time.

The test of the third quarter quotation of 1.90c., Pittsburgh, on plates, shapes and bars has been further delayed by the willingness of many producers to extend second quarter contracts carrying a price of 1.85c. That there will still be a determined effort to raise the market on these products is shown by advances for the fourth quarter named by Steel Corporation subsidiaries, following the receipt of inquiries for that period. The prices are 2c. at Pittsburgh, 2.10c. at Chicago and 2.15c. at Birmingham.

With considerable tonnage for the third quarter not yet definitely under contract, producers expect current prices on these products to show increasing firmness.

The customary seasonal variations in farm implement production are notably absent this year. Chicago reports that agricultural equipment plants, especially those making tractors, continue to fall behind in deliveries notwithstanding that they are operating above rated capacity.

No summer lull has developed in the automobile industry. Steel is being ordered freely by manufacturers that are bringing out new models, as well as by builders of low-priced cars, among which the Ford company continues to expand production.

The large volume of steel being placed for construction work is again reflected in fabricating awards, which total 43,000 tons for the week. Included was 14,000 tons for a bridge at Louisville.

Increased steel business is expected in coming months from the oil industry, and steel exports show no signs of falling off. In addition to contracts for 225,000 tons of oil and gas pipe line placed in the last few weeks, there are now 1200 miles of such pipe actively under negotiation, including 435 miles of 10¾-in., or 40,000 tons, for a Standard Oil subsidiary.

Business in tin plate is particularly good, supporting a mill operation of 90 per cent.

Rail production is still receding, at Chicago having reached a 60 per cent rate, but the beginnings of the fall buying movement are seen in four inquiries, among them 37,000 tons for the Norfolk & Western and 15,000 tons for the Northern Pacific. Domestic buying of railroad equipment is light, but the Argentine State Railroads have placed orders for 1100 freight cars with American shops.

Current steel output at Chicago ranges from 75 to 80 per cent, while the rate in the Greater Pittsburgh district is 70 to 75 per cent. Chicago production a year ago was 70 per cent of capacity and that of Pittsburgh 65 to 70 per cent. Two years ago, when steel capacity was smaller, the Chicago percentage was 85 and that of Pittsburgh 75.

Steel ingot output for the first half of this year, at 24,792,883 tons, exceeded that of the corresponding half of 1926 by 639,000 tons. Since crucible and electric steel ingots are no longer included in production reports, it is estimated that the gain was about 200,000 tons greater than a comparison of the available figures shows. Hence the increase over the previous record is placed at 3½ per cent.

THE IRON AGE composite for pig iron has declined to $17.09 a ton, the lowest figure in more than 12 years. The finished steel composite has dropped to 2.326c. a lb., but remains above the low point for the year, which was in January.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	July 10, 1928	July 2, 1928	June 12, 1928	July 12, 1927
No. 2, fdy., Philadelphia	*$20.26*	$20.76	$20.76	$21.26
No. 2, Valley furnace	16.75	16.75	16.75	18.00
No. 2, Southern, Cin'ti	19.19	19.19	19.69	20.94
No. 2, Birmingham	15.50	15.50	16.00	17.25
No. 2 foundry, Chicago*	*17.50*	18.00	18.00	20.00
Basic, del'd eastern Pa	19.00	19.00	19.00	20.75
Basic, Valley furnace	16.00	16.00	15.35	17.50
Valley Bessemer, del'd P'gh	18.76	18.76	18.76	20.26
Malleable, Chicago*	*17.50*	18.00	18.00	20.00
Malleable, Valley	17.00	17.00	17.00	18.00
Gray forge, Pittsburgh	18.01	18.01	18.01	19.26
L. S. charcoal, Chicago	27.04	27.04	27.04	27.04
Ferromanganese, furnace	105.00	105.00	105.00	90.00
Rails, Billets, Etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	36.00
Bess. billets, Pittsburgh	32.00	32.00	32.00	33.00
O.-h. billets, Pittsburgh	32.00	32.00	32.00	33.00
O.-h. sheet bars, P'gh	32.00	32.00	33.00	33.50
Forging billets, P'gh	38.00	38.00	38.00	39.00
O.-h. billets, Phila	*37.30*	38.30	38.30	38.30
Wire rods, Pittsburgh	42.00	42.00	42.00	42.00
	Cents	Cents	Cents	Cents
Skelp grvd. steel, P'gh, lb	1.85	1.85	1.85	1.80
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.12	2.12	2.12	2.12
Iron bars, Chicago	2.00	2.00	2.00	2.00
Steel bars, Pittsburgh	1.85	1.85	1.85	1.80
Steel bars, Chicago	2.00	2.00	2.00	2.00
Steel bars, New York	2.19	2.19	2.19	2.14
Tank plates, Pittsburgh	1.85	1.85	1.85	1.80
Tank plates, Chicago	2.00	2.00	2.00	2.00
Tank plates, New York	2.17½	2.17½	2.17½	2.09
Beams, Pittsburgh	1.85	1.85	1.85	1.80
Beams, Chicago	2.00	2.00	2.00	2.00
Beams, New York	2.14½	2.14½	2.14½	2.04
Steel hoops, Pittsburgh	2.20	2.20	2.20	2.30

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Sheets, Nails and Wire,	July 10, 1928	July 2, 1928	June 12, 1928	July 12, 1927
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, Pittsburgh	2.65	2.65	2.65	3.00
Sheets, black, No. 24, Chicago dist. mill	2.75	2.75	2.80	3.10
Sheets, galv., No. 24, Pittsburgh	3.50	3.50	3.50	3.85
Sheets, galv. No. 24, Chicago dist. mill	3.60	3.60	3.70	3.95
Sheets, blue, 9 & 10, Pittsburgh	2.00	2.00	2.00	2.25
Sheets, blue, 9 & 10, Chicago dist. mill	2.10	2.10	2.10	2.35
Wire nails, Pittsburgh	2.55	2.55	2.55	2.50
Wire nails, Chicago dist. mill	2.60	2.60	2.60	2.55
Plain wire, Pittsburgh	*2.40*	2.50	2.50	2.40
Plain wire, Chicago dist. mill	*2.45*	2.55	2.55	2.45
Barbed wire, galv., Pittsburgh	*3.20*	3.35	3.35	3.20
Barbed wire, galv., Chicago dist. mill	*3.25*	3.40	3.40	3.25
Tin plate, 100 lb. box, P'gh	$5.25	$5.25	$5.25	$5.50
Old Material, Per Gross Ton:				
Heavy melting steel, P'gh	$14.00	$14.00	$14.75	$15.00
Heavy melting steel, Phila	13.00	13.00	13.50	13.50
Heavy melting steel, Ch'go	12.25	12.25	12.75	12.00
Carwheels, Chicago	*12.75*	13.00	13.00	13.50
Carwheels, Philadelphia	15.50	15.50	15.50	15.00
No. 1 cast, Pittsburgh	14.25	14.25	14.25	15.00
No. 1 cast, Philadelphia	15.50	15.50	16.00	16.00
No. 1 cast, Ch'go (net ton)	13.50	13.50	14.00	14.50
No. 1 RR. wrot. Phila	13.50	13.50	13.50	16.00
No. 1 RR. wrot. Ch'go (net)	11.00	11.00	11.50	11.25
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$2.60	$2.60	$2.60	$3.00
Foundry coke, prompt	3.75	3.75	3.75	4.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	*14.75*	14.87½	14.87½	12.62½
Electrolytic copper, refinery	14.50	14.50	14.50	12.37½
Zinc, St. Louis	6.20	6.20	6.15	6.17½
Zinc, New York	6.55	6.55	6.50	6.52½
Lead, St. Louis	*6.10*	6.15	6.15	5.95
Lead, New York	*6.20*	6.30	6.30	6.20
Tin (Straits), New York	*46.25*	46.12½	48.62½	63.50
Antimony (Asiatic), N. Y.	9.62½	9.62½	9.75	11.75

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Steel Sales Surprisingly Good for July—Situation Considered Healthy Notwithstanding Some Price Weakness

PITTSBURGH, July 10.—General sales in the steel market in this district during the past week were surprisingly good when the season is considered, and were rather well spread out. Significance was seen in the fact that during the holiday period most mills were closed down for a minimum of time. Steel works operations are estimated at 70 to 75 per cent of capacity. Excepting a few lines, requirements for consumption are being well maintained and orders for third quarter, when aggregated, represent a good volume. Conditions generally are above the average for this time of the year. Tin plate is particularly strong and mills are operating at about 90 per cent of capacity, and strong pressure is being exerted for delivery. There is expectation of large packs of vegetables and fruit.

While there was a let-up in demand for oil country goods following the recent heavy orders, some large requirements for a pipe line are expected to develop and encouragement has been given by a stronger market for crude oil

Demand for structural shapes, bars and plates is fair. On the larger tonnages some second quarter contracts have been extended at 1.85c.

Structural fabricators report good business, although most inquiries involve small jobs. The largest contract of the past week, placed with the American Bridge Co. by the Louisville Bridge Commission for a bridge over the Ohio River between Louisville, Ky., and Jeffersonville, Ind., called for 14,000 tons. Demand from the automotive industry for sheets, cold-finished steel bars and strips is fair, but on the last named product there has been a slight recession, and the market is rather irregular.

The increased production of ingots during the first half and June of the current year, when compared with the corresponding periods of last year, together with the increase in the unfilled tonnage of the United States Steel Corporation, are accepted as barometers showing the healthy tone of the steel market.

Inquiry for coke and pig iron is extremely dull and neither market has been given a test; meanwhile quotations are unchanged.

Ferroalloys.—There are still last half requirements to be placed, but most consumers of ferromanganese are rather well covered for this period. Inquiry is light. The market is reported to be firm at $105, Atlantic seaboard, for both domestic and foreign material. Shipments are still being made, however, on old contracts at $100. Only moderate specifications are being received against contracts for spiegeleisen. The standard grade continues to be quoted at $31 to $32, furnace. Consumers of 50 per cent ferrosilicon are covered for the year.

Pig Iron.—Extreme dullness prevails in the market for pig iron. While basic is quoted at $16, Valley, it is believed to be easy at this figure and that a test might develop a somewhat lower price. Buyers generally are remaining out of the market for third quarter tonnages. No. 2 foundry iron is quoted at $16.75, Valley. Bessemer

and malleable iron are quoted at $17, with the former showing a little more strength than the latter. Low phosphorus iron continues to move in small lots at about $28.25, delivered. While the iron being sold is in small lots, it has been observed that immediate shipment generally is required, and this is taken to indicate that stocks in the hands of consumers are small.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$16.00
Bessemer	17.00
Gray forge	$16.25 to 16.50
No. 2 foundry	16.75
No. 3 foundry	16.25 to 16.50
Malleable	17.00
Low phos., copper free	26.50

Freight rate to Pittsburgh or Cleveland district, $1.76.

Semi-Finished Steel.—The market for sheet bars has settled to a basis of $32, Pittsburgh, and is quiet. Demand for slabs, which are quoted at $32 to $34, Pittsburgh, also is inactive, while light demand exists for billets, the base size of which takes a price of $32, Pittsburgh, with $1 differential over that figure for the small sizes. Forging billets are quoted at $38, Pittsburgh. Demand for soft wire rods, which command $42, base Pittsburgh, is slow.

Bars, Plates and Shapes.—From the standpoint of tonnage, the market for these hot-rolled products is fairly good, although some buyers still show some resistance to the price of 1.90c., base Pittsburgh. While on the one hand mills are trying to get 1.90c. from the small or occasional buyer, some have extended second quarter quotations to the larger buyers for third quarter. The rather general way in which this has been done leaves room for doubt as to whether the 1.90c. price will become effective in this quarter to important buyers. Fabricators, automobile manufacturers and bolt and nut makers are buying in fair volume. Railroad buying is light. The largest fabricating contract during the week, amounting to 14,000 tons, went to the American Bridge Co. and was awarded by the Louisville Bridge Commission for a bridge over the Ohio River between Louisville, Ky., and Jeffersonville, Ind. The American Bridge Co. also was awarded a contract for 2600 tons for a foundry building for the Chevrolet Motor Co. at Saginaw, Mich. Inquiries coming to fabricators are numerous, but for the most part involve only small lots. Demand for iron bars is only moderate and prices remain unchanged.

Rails and Track Supplies.—Only small orders are being placed for light rails, quoted at $36, Pittsburgh, a small amount of the business coming from coal mines. Demand for both small and standard spikes is quiet. The Norfolk & Western Railroad has put out its annual inquiry for rails, which calls for 37,000 tons, for July-January delivery. This is a somewhat smaller tonnage than this railroad bought in each of the two previous years.

Wire Products.—The card just put out by the American Steel & Wire Co., naming third quarter prices for jobbers, puts into official effect prices that have been prevailing, although representing a 10c. per 100 lb. reduction under some quotations. The outstanding change from the former practice is to put in a 10c. per 100 lb. differential instead of the former 5c. differential as between jobbers and retailers. For this time of year, demand for wire nails and cement-coated nails, quoted at $2.55 per 100 lb. keg, Pittsburgh or Cleveland, is fair and specifications in July so far have been better than they were in June. Inquiry for plain bright, hard fence wire, quoted at $2.40 base, per 100 lb., is only moderate, while that for barbed wire is dull, as is generally the situation during the harvesting season. Operations of wire mills range from 50 to 60 per cent of capacity.

Tubular Goods.—New orders for standard pipe are being placed in fair-sized volume, while those for oil line pipe are light, but some good sized inquiries are current and the business is expected to be closed soon. Buttweld demand is fairly active, some of it coming from the building and construction industry. Specifications for mechanical seamless tubing, coming largely from the automotive industry, is satisfactory. Operations of pipe mills in this district range from 60 to 70 per cent of capacity.

Tin Plate.—The Fourth of July holiday, as usual, saw a letup in operations, but the reduction in output was held to a minimum because of heavy requirements before makers. Probably not over an average of four turns was lost. The output generally is at about 90 per cent of capacity. The arrival of warm weather has been an influence in reducing the tonnage somewhat, but also is developing crops which have been backward. Tin plate production for the year to date has been very satisfactory, and present indications are that the output for the year will be relatively better than that of any other steel line. A few consumers, who had not adequately specified for first half contracts, have placed additional orders to cover their requirements.

Sheets.—Sheet makers report that the volume of business is surprisingly good for this season, which is generally the dullest of the year. A number of automobile makers are in production on new models and are taking good-sized requirements. The volume of business for the first half was also good. Prices are neither better nor worse, but seem to be at the bottom. Black sheets are quoted at 2.65c.; galvanized sheets at 3.50c., and blue annealed at 2c., all f.o.b. Pittsburgh. A small amount of car business has been placed, but railroads generally are buying lightly.

Cold-Finished Steel Bars and Shafting.—Indications are that the cold-finished steel industry will produce a larger tonnage during the third quarter of the year than it did during the corresponding period of last year. This is partially due to the demand from the Ford Motor Co., which was not in the market one year ago. Automobile producers continue to place fair-sized orders for cold-finished steel bars, which are quoted at 2.10c., Pittsburgh. Implement manufacturers and jobbers are also taking moderate tonnage.

Hot-Rolled Flats.—Specifications during the past week showed a recession, although they continue to be fair. The letup was probably due to the Fourth of July holiday. Automobile makers are rather well covered for their third quarter requirements.

Cold-Rolled Strips.—As in the case

The Iron Age Composite Prices

Finished Steel

July 10, 1928, 2.326c. a Lb.

One week ago	2.341c.
One month ago	2.341c.
One year ago	2.367c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and black sheets. These products constitute 87 per cent of the United States output of finished steel.

	High		Low	
1928	2.364c.,	Feb. 14;	2.314c.,	Jan. 3
1927	2.453c.,	Jan. 4;	2.293c.,	Oct. 25
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	Apr. 24;	2.446c.,	Jan. 2

Pig Iron

July 10, 1928, $17.09 a Gross Ton

One week ago	$17.25
One month ago	17.23
One year ago	18.59
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1928	$17.75,	Feb. 14;	$17.09,	July 10
1927	19.71,	Jan. 4;	17.54,	Nov. 1
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	Mar. 20;	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mill	1.85c. to 1.90c.
F.o.b. Chicago	2.00c.
Del'd Philadelphia	2.17c. to 2.22c.
Del'd New York	2.19c. to 2.24c.
Del'd Cleveland	2.04c. to 2.09c.
F.o.b. Cleveland	1.85c.
F.o.b. Lackawanna	1.95c.
F.o.b. Birmingham	2.05c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills	1.95c. to 2.00c.
F.o.b. Birmingham	2.00c. to 2.15c.

Rail Steel

F.o.b. mills east of Chicago district	1.75c.
F.o.b. Chicago Heights mill	1.85c.

Iron

Common iron, f.o.b. Chicago	2.00c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.12c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mills	1.85c. to 1.90c.
F.o.b. Chicago	2.00c.
F.o.b. Birmingham	2.05c.
Del'd Cleveland	2.04c. to 2.09c.
Del'd Philadelphia	2.10c. to 2.15c.
F.o.b. Coatesville	2.00c. to 2.05c.
F.o.b. Sparrows Point	2.00c.
F.o.b. Lackawanna	1.95c.
Del'd New York	2.17½c. to 2.22½c.
C.i.f. Pacific ports	2.25c. to 2.30c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills	1.85c. to 1.90c.
F.o.b. Chicago	2.00c.
F.o.b. Birmingham	2.05c.
F.o.b. Lackawanna	1.95c.
F.o.b. Bethlehem	2.00c.
Del'd Cleveland	2.04c. to 2.09c.
Del'd Philadelphia	2.06c. to 2.18c.
Del'd New York	2.14½c. to 2.19½c.
C.i.f. Pacific ports	2.35c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
Narrower than 3 in., P'gh	2.20c. to 2.30c.
From 3 in. to 6 in., P'gh	1.85c. to 2.10c.
6 in. and wider, P'gh	*1.75c. to 1.90c.
Narrower than 3 in., Chicago	2.30c.
From 3 to 6 in., Chicago	2.20c.
6 in. and wider, Chicago	2.00c.
Cotton ties, f.o.b. Atlantic and Gulf ports:	
Carlots per 45-lb. bundle	$1.27
2000 bundle lots	1.25
Larger lots	1.23

*Mills follow plate or sheet prices according to gage on wider than 12 in.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills	2.10c.
Bars, f.o.b. Chicago	2.10c.
Bars, Cleveland	2.15c.
Shafting, ground, f.o.b. mill	*2.45c. to 2.90c.
Strips, 1 up to 3 tons, P'gh	3.00c. to 3.15c.
Strips, 1 up to 3 tons, Cleveland	2.90c. to 3.00c.
Strips, 1 up to 3 tons, del'd Chicago	3.30c. to 3.45c.
Strips, 1 up to 3 tons, Worcester	3.15c. to 3.30c.
Fender stock, Pittsburgh	4.10c.

*According to size.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails	$2.55
Galvanized nails	4.55
Galvanized staples	3.25
Polished staples	3.00
Cement coated nails	2.55

	Base Per 100 Lb.
Bright plain wire, No. 9 gage	$2.40
Annealed fence wire	2.55
Spring wire	3.40
Galv'd wire, No. 9	3.00
Barbed wire, galv'd	3.20
Barbed wire, painted	2.95

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., (wire) mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Woven Wire Fence

Base to Retailers Per Net Ton

F.o.b. Pittsburgh	$65.00
F.o.b. Cleveland	65.00
F.o.b. Anderson, Ind.	66.00
F.o.b. Chicago district mills	67.00
F.o.b. Duluth	68.00
F.o.b. Birmingham	68.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. P'gh	2.00c. to 2.10c.
Nos. 9 and 10, f.o.b. Chicago dist. mill	2.10c.
Nos. 9 and 10, del'd Cleveland	2.09c. to 2.19c.
Nos. 9 and 10, del'd Philadelphia	2.32c. to 2.42c.
Nos. 9 and 10, f.o.b. Birmingham	2.20c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.65c. to 2.75c.
No. 24, f.o.b. Chicago dist. mill	2.75c.
No. 24, del'd Cleveland	2.79c. to 2.89c.
No. 24, del'd Philadelphia	2.97c. to 3.07c.
No. 24, f.o.b. Birmingham	2.95c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade	3.85c. to 3.90c.
No. 24, f.o.b. Pittsburgh, B grade	3.65c. to 3.70c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.50c. to 3.60c.
No. 24, f.o.b. Chicago dist. mill	3.60c.
No. 24, del'd Cleveland	3.54c. to 3.69c.
No. 24, del'd Philadelphia	3.82c. to 3.92c.
No. 24, f.o.b. Birmingham	3.70c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.85c. to 2.90c.
No. 28, f.o.b. Chicago dist. mill	3.10c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	4.00c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill primes	4.10c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.25
Standard cokes, f.o.b. Gary	5.35

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)
(Per package, 20 x 28 in.)

8-lb. coating I.C. $11.20	25-lb. coating I.C. $16.70
15-lb. coating I.C. 14.00	30-lb. coating I.C. 17.75
20-lb. coating I.C. 15.30	40-lb. coating I.C. 19.85

Alloy Steel Bars

(F.o.b. maker's mill)
Alloy Quality Bar Base, 2.65c.

S.A.E. Series Numbers		Alloy Differential	Net Price 100 Lb. Bars
2000	(½% Nickel)	$0.25	$2.90
2100	(1¼% Nickel)	0.55	3.20
2300	(3½% Nickel)	1.50	4.15
2500	(5% Nickel)	2.25	4.90
3100	Nickel Chromium	0.55	3.20
3200	Nickel Chromium	1.35	4.00
3300	Nickel Chromium	3.80	6.45
3400	Nickel Chromium	3.20	5.85
4100	Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50	3.15
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70	3.35
4600	Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel)	1.05	3.70
5100	Chromium Steel (0.60 to 0.90 Chromium)	0.35	3.00
5100	Chromium Steel (0.80 to 1.10 Chromium)	0.45	3.10
5100	Chromium Spring Steel	0.20	2.85
6100	Chromium Vanadium Bars	1.20	3.85
6100	Chromium Vanadium Spring Steel	0.95	3.60
9250	Silicon Manganese Spring Steel	0.25	2.90
	Chromium Nickel Vanadium	1.50	4.15
	Carbon Vanadium	0.95	3.60

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 down to and including 2½ in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

Slabs with sectional area of 16 in. or over carry the billet price; slabs with sectional area of 12 in. to 16 in. carry a $5 extra above the billet price and slabs with a sectional area under 12 in. carry the bar price.

Band sizes are 40c. per 100 lb. higher.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	36.00

Track Equipment

	Base Per 100 Lb.
Spikes, ⅝ in. and larger	$2.80
Spikes, ½ in. and smaller	2.80
Spikes, boat and barge	3.00
Tie plates, steel	2.15
Angle bars	2.75
Track bolts, to steam railroads	$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	13
1 to 3	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	13
9 and 10	54	41½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ to ⅜	+19	+54
¼ to ⅜	47	30½	½	21	17
½	53	42½	¾	28	12
¾	58	47½	1 to 1½	30	14
1 to 1½	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	7
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		*Charcoal Iron*	
2 to 2¼ in.	27	1½ in.	+18
2½ to 2¾ in.	37	1¾ to 1⅞ in.	+ 8
3 in.	40	2 to 2¼ in.	— 2
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	46	3¼ to 4½ in.	— 9

Beyond the above base discounts, the following extra discounts are given:

Lap Weld Steel		*Charcoal Iron*
Under 5000 lb.	4 Fives	1 Ten
5000 lb. to 12,000 lb.	5 Fives	2 Tens
12,000 lb. to 21,000 lb.	6 Fives	2 Tens & 2½
21,000 lb. and over	7 Fives	2 Tens & 5

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	63	3 in.	48
1¼ to 1½ in.	55	3¼ to 3½ in.	50
1¾ in.	39	4 in.	53
2 to 2¼ in.	34	4½, 5 and 6 in.	45
2½ to 2¾ in.	42		

Hot Rolled

2 and 2¼ in.	40	3¼ and 3½ in.	56
2½ and 2¾ in.	48	4 in.	59
3 in.	54	4½, 5 and 6 in.	48

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base (carloads)	55
Carbon, 0.30% to 0.40%, base	50

Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

of hot-rolled flats, demand for cold-rolled strips has shown a slight falling off, but not to the extent usual at this time of year. Operations vary, but are holding up well, and it is likely that the July rate will not be more than 10 per cent below that of June. Prices on some of the larger tonnages are somewhat easier. The bulk of business takes a minimum level of 3c., base, while for lots of 3 tons or more the going quotation is 2.75c.

Bolts, Nuts and Rivets.—Buyers of bolts, nuts and rivets continue to specify regularly, most of the buying being on a hand-to-mouth basis. There are a great many rush orders. Railroad buying is light. Operations are at about 60 per cent of capacity.

Coke and Coal.—The market for fuel continues to lag and prices are unchanged. Inquiry for coal is light, although there has been a slight improvement in the movement of Lake cargo tonnage. Consumers generally have good-sized stocks on hand and are not expected to come into the market actively in the immediate future. Demand for coke also is small, and the limited buying that is taking place covers only small lots for spot delivery of both furnace and foundry fuel. Only three merchant furnaces are operating in the Valley, which is reflected in the light inquiries for 48-hr. fuel. Foundry operations are estimated at about 50 per cent of capacity, and this has resulted in limiting activity in the market for foundry coke. Little third quarter contracting has been done, though some contracts have been quietly renewed and a number of negotiations are under way.

Old Material.— Further weakness has developed during the past week in the market for scrap. A number of grades are down 50c. a ton, while a drop of 25c. has been made on No. 2 railroad wrought. Heavy melting steel continues to take a range of $13.75 to $14.25, and is easy at this spread. Buying is so limited that a real test of the market has not been made. The weak tone is due partly to the fact that dealers who were short on contracts appear to be practically covered, and also to the little interest shown by the mills. At the same time dealers seem to be not so willing to sell, which would indicate that they do not want to go short on a low market. Purchases that are being made for the most part are only to meet immediate requirements. Dealers who recently covered on heavy melting steel to fill contracts no longer are paying $14.25. Considerable interest is shown in the Pennsylvania list of 51,000 tons of various grades, on which bids will be closed tomorrow (Wednesday). Some dealers believe that the offering will bring the maximum levels and that it will mean short covering rather than a stronger market. Included in the grades which have dropped 50c. are scrap rails, bundled sheets, heavy breakable cast, heavy steel axle turnings for the open-hearth furnace, shoveling steel turnings, mixed borings and turnings and rails 3 ft. and under. The Norfolk & Western Railroad will close bids on Thursday for approximately 7500 tons.

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.60c.
Hoops	4.00c. to 4.50c.
Black sheets (No. 24), 25 or more bundles	3.55c.
Galv. sheets (No. 24), 25 or more bundles	4.40c.
Blue ann'l'd sheets (No. 10), 25 or more sheets	3.10c.
Galv. corrug. sheets (No. 28), per square	$4.31
Spikes, large	3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count,	60 per cent off list
Machine bolts, 100 count,	60 per cent off list
Carriage bolts, 100 count,	60 per cent off list
Nuts, all styles, 100 count,	60 per cent off list
Large rivets, base per 100 lb.	$3.50
Wire, black soft ann'l'd, base per 100 lb.	$3.00 to 3.10
Wire, galv. soft, base per 100 lb.	3.00 to 3.10
Common wire nails, per keg	3.00
Cement coated nails, per keg	3.05

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
Heavy melting steel	$13.75 to $14.25
Scrap rails	13.25 to 13.50
Compressed sheet steel	13.50 to 14.00
Bundled sheets, sides and ends	12.50 to 13.00
Cast iron carwheels	14.00 to 14.50
Sheets bar crops, ordinary	14.00 to 14.50
Heavy breakable cast	11.50 to 12.00
No. 2 railroad wrought	13.75 to 14.00
Heavy steel axle turnings	12.00 to 12.50
Machine shop turnings	9.00
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	15.00 to 15.50
Railr. coil and leaf springs	15.00 to 15.50
Rolled steel wheels	15.00 to 15.50
Low phos. billet and bloom ends	19.00 to 19.50
Low phos., mill plate	17.50 to 18.00
Low phos., light grade	16.50 to 17.00
Low phos. sheet bar crops	17.50 to 18.00
Hvy. steel axle turnings	12.50 to 13.00
Electric Furnace Grades:	
Low phos. punchings	16.50 to 17.00
Hvy. steel axle turnings	12.50 to 13.00
Blast Furnace Grades:	
Short shov'l'g steel turnings	9.50
Short mixed borings and turnings	9.50
Cast iron borings	10.00
No. 2 busheling	8.50 to 9.00
Rolling Mill Grades:	
Steel car axles	18.00 to 18.50
No. 1 railroad wrought	10.50 to 11.00
Sheet bar crops	16.00 to 16.50
Cupola Grades:	
No. 1 cast	14.25 to 14.50
Rails 3 ft. and under	15.00 to 15.50
Malleable Grades:	
Railroad	13.75 to 14.00
Industrial	13.25 to 13.50
Agricultural	12.75 to 13.00

The Employment and Vocational Guidance Section of the Welfare Council, 151 Fifth Avenue, New York, made up of the non-profit-making organizations, has compiled a list of the organizations which help seekers after employment or in the study of a suitable vocation.

Automobile Business Prospects Good

With production of cars and trucks in the United States and Canada in June approximating 440,000, the total for the first half of the year has gone well beyond the total in the first half of 1927. This gain over last year will be much larger in the last half, primarily because Ford Motor Co. was completely out of production in the last half last year and is now operating at better than 3000 cars daily. This rate is expected to rise to 5000 cars daily during the summer, according to *Automotive Industries*, and to remain at or above this figure throughout the last half.

Keener competition throughout the last half will probably be occasioned by the appearance of a considerable number of new models during July and August. Many cars which have enjoyed unusual sales records during the first half will be continued without change and will be compelled to meet the public interest in the newer models. The fact that the Ford company is still several months behind on orders helps to limit competition in the low priced field but in price fields above this group the sales effort will be much keener.

Export shipments are generally at a higher rate than in any preceding year and promise to continue high throughout the year.

Simplification of Shovels, Spades and Scoops

Preparatory to calling a conference of the standing committee on the simplified practice recommendation concerning shovels, spades and scoops, to consider the revision or reaffirmation of this recommendation, the division of simplified practice of the Department of Commerce, Washington, has been requested to initiate a survey among the acceptors of the simplification to ascertain certain information for the consideration of the committee.

In making announcement of the survey the division stated that past experience of the division with other industries has proved that periodic resurveys covering simplified practice recommendations are essential to keep abreast of current practice, promote greater adherence, insure a larger degree of application and provide the necessary material for the use of the standing committee concerned for an intelligent revision or reaffirmation of each recommendation. The questionnaire being sent out is intended to bring this situation about.

The Stout Metal Airplane Co., a division of Ford Motor Co., Dearborn, Mich., has increased production on its standard, all-metal, tri-motored transport plane so that schedule now calls for two planes a week. The tri-motored transport, of the type which now makes daily trips between Detroit and Cleveland, sells for $49,000.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over	$32.00 to $33.00
Rerolling, under 4-in. to and including 1¾-in.	33.00 to 34.00
Forging, ordinary	38.00
Forging, guaranteed	43.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer	$32.00 to $33.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger	$32.00 to $33.00
Smaller than 8 in. x 2 in.	33.00 to 34.00

Skelp

	Per Lb.
Grooved	1.85c. to 1.90c.
Sheared	1.85c. to 1.90c.
Universal	1.85c. to 1.90c.

Wire Rods

	Per Gross Ton
*Common soft, base	$42.00
Screw stock	$5.00 per ton over base

*Chicago mill base is $43. Cleveland mill base, $42.

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.55
Old range non-Bessemer, 51.50% iron	4.40
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.25
High phosphorus, 51.50% iron	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	10.00c.
Iron ore, Swedish, average 66% iron,	9.25c. to 9.50c.
Manganese ore, washed, 52% manganese, from the Caucasus	39c.
Manganese ore, Brazilian, African or Indian, basis 50%	38c. to 39c.
Tungsten ore, high grade, per unit, in 60% concentrates	$11.00 to $11.25

	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00

	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.60 to $2.75
Foundry, f.o.b. Connellsville prompt	3.50 to 4.25
Foundry, by-product, Ch'go ovens	8.00
Foundry, by-product, New England, del'd	11.00
Foundry, by-product, Newark or Jersey City, delivered	9.00 to 9.40
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry by-prod., del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.40 to $1.80
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75
Gas coal, ¾-in., f.o.b. Pa. mines	2.00 to 2.10
Mine run gas coal, f.o.b. Pa. mines	1.75 to 1.90
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.05
Gas slack, f.o.b. W. Pa. mines	1.10 to 1.15

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd	$105.00
Foreign, 80%, Atlantic or Gulf port, duty paid	105.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$31.00 to $32.00
Domestic, 16 to 19%	29.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50 to $88.50
75%	130.00 to 140.00

	Per Gross Ton Furnace		*Per Gross Ton Furnace*
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	45.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		*Per Gross Ton*
10%	$30.00	12%	$34.00
11%	32.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		*Per Gross Ton*
6%	$23.00	10%	$28.00
7%	24.00	11%	30.00
8%	25.00	12%	32.00
9%	26.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd	95c.
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton	$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per gross ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	$17.00
No. 2 lump, Illinois and Kentucky mines	$18.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$16.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	$32.50

Fire Clay

	Per 1000 f.o.b. Works First Quality	Second Quality
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	—
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	70
†Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagons	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	6.75c. to 6.50c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.
†Bolts with rolled thread up to and including ⅝ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages, Pittsburgh	80, 10 and 2½
Stove bolts in packages, Chicago	75, 20, 10 and 5
Stove bolts in bulk, Pittsburgh	80, 10 and 5
Stove bolts in bulk, Chicago	75, 20, 10, 5 and 2½
Tire bolts	60, 5 and 5

Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55 to 60 per cent apply.

Large Rivets

(½-In. and Larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.90
F.o.b. Chicago	3.00

Small Rivets

(7/16-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70 and 10
F.o.b. Cleveland	70 and 10
F.o.b. Chicago	70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 10
Milled standard set screws, case hardened,	80 and 10
Milled headless set screws, cut thread	80
Upset hex. head cap screws, U.S.S. thread,	85 and 5
Upset hex. cap screws, S.A.E. thread	85 and 5
Upset set screws	80, 10 and 10
Milled studs	70 and 5

Chicago

Foundry Iron Reduced 50c. a Ton—Wire Products Lower, Cast Iron Pipe Up—Steel Demand Fairly Steady

CHICAGO, July 12.—Notwithstanding that iron and steel business is well ahead of the first 10 days of July last year and that the tapering in demand is much more gradual than in the early summer of 1927, there persists among buyers and sellers alike an uncertainty as to prices. Wire products have been marked off $2 a ton at a time when output averages close to 60 per cent of mill capacity, or within about 5 points of what some believe represents the full consumptive capacity of the country. Chicago producers have cut pig iron 50c. a ton, not wholly as a stimulant to business but to limit boat shipments and to reach farther from the close confines of this immediate territory. The scrap market is dull, with a decided leaning toward lower prices. In contrast to these movements is the determination of some cast iron pipe manufacturers to ask $2 a ton more for their products.

Two inquiries for 1928 rail requirements, totaling over 50,000 tons, are adding interest to the railroad track supply market. However, this business, even if placed at an early date, will not stem the decline of rail rolling schedules, which now have been reduced to less than 60 per cent of capacity.

The rate of ingot output remains between 75 and 80 per cent of capacity. The holiday last week served as a check to the flow of incoming business to local mills and recovery has been slow, with the result that new sales in plates, shapes and bars have fallen sharply below production. Specifications are about equal to 75 per cent of local mill capacity.

Pig Iron.—Local producers of foundry pig iron have announced price cuts of 50c. a ton, bringing the No. 2 foundry grade to $17.50, f.o.b. local furnace. The effect of this move is looked for in the curtailment of boat shipments from Lake Erie and an expansion of the narrowed territory now served by local producers, rather than in a sharp stimulant to buying in and near Chicago. Some interest is being shown in third quarter and last half needs, but for the most part 30 to 60-day requirements are as far as buyers care to go. Unsteadiness on scattered sales of silvery is noted. Charcoal iron is being sold in some cases at bargain prices and in other instances at $24, furnace.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$17.50
N'th'n No. 1 fdy., sil. 2.25 to 2.75	18.00
Malleable, not over 2.25 sil.	17.50
High phosphorus	17.50
Lake Super. charcoal, sil. 1.50	27.04
So'th'n No. 2 fdy. (all rail)	21.51
So'th'n No. 2 (barge and rail)	21.01
Low phos., sil. 1 to 2, copper free	$28.50 to 29.00
Silvery, sil. 8 per cent	29.79
Bess. ferrosilicon, 14-15%	46.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—Although $33, Hazard, Pa., is the price quoted on spiegeleisen, there have been no sales that can be considered as tests. Shipments of ferromanganese are light, following heavy releases against first half contracts at prices more favorable to buyers than those now in effect. It is reported that some users have stored enough of this material to meet requirements for the remainder of the year and that in at least some instances second half contracts will be of little value to sellers.

Prices delivered Chicago: 80 per cent ferromanganese, $112.56; 50 per cent ferrosilicon, $83.50 to $87.50; spiegeleisen, 19 to 21 per cent, $40.76.

Plates.—Competition for oil storage tank materials is unusually keen and it appears that producers in the South and to the east have the edge on most of this business, much of which is for water shipment to Texas ports and fabrication near the place of erection. In view of this situation, there is little in the way of plate tonnage that is in sight either for local fabricators or Chicago steel mills. Specifications against old tank orders are well filled, and in the absence of heavy car purchases, the primary outlet for plate mill products is in the structural field. Highland Park, Ill., will need 200 tons for an elevated water tank. The Chicago Bridge & Iron Co. will build a water tank, requiring 150 tons, for Wilmette, Ill. Reports of prospective large railroad equipment purchases are going the rounds, but there is little tangible evidence of such a move on the part of the Western railroads. The grain movement is getting under way in western and southern Kansas and agencies there estimate that 5 to 10 per cent more cars will be needed this year than last. The Missouri-Kansas-Texas has closed with the American Car & Foundry Co. for 19 baggage and mail cars. Among locomotive inquiries is one for an experimental, high-pressure engine for the Delaware & Hudson and a 2-8-2 type locomotive for the Alaska Railroad. Buyers of plates are now able to obtain deliveries in two to three weeks. Prices, except for delivery to the southwest, remain at 2c., Chicago.

Mill prices on plates, per lb.: 2c., base Chicago.

Structural Material.—Interest in pending structural jobs is centering in the Fine Arts Building, Chicago, which will take 5000 tons, and the Patterson Estate Building, which was originally estimated to require about 2000 tons, but which will be built with a tower, thus increasing the tonnage of steel needed. Litigation over air rights above the Randolph Street terminal (Chicago) of the Illinois Central has been terminated, clearing the way for further planning on the Apparel Mart, which engineers now estimate will require between 75,000 and 100,000 tons of structural steel. Miscellaneous inquiries throughout most of the Middle West are in good volume and the outlook is favorable for sustained shop operations during most of the summer. Small and large contracts in late weeks have been in good balance. Some shops are now subletting to other fabricators portions of large contracts, on which the builders are stressing delivery, Notwithstanding that shops are well supplied with work, there appears to be no lessening in the keenness of competition, nor any decided effort to get prices above the low levels reached in the late spring. Prices for structural material are steady at 2c., Chicago.

Mill prices on plain material, per lb.: 2c., base, Chicago.

Reinforcing Bars. — Sales remain moderately active in a market which has been held back by adverse construction weather. Two Chicago public school buildings will require a total of 500 tons. Small contracts are numerous, indicating that where hesitancy in making awards is shown, it is on those jobs where large sums of money are involved. Further tests of prices for heavy tonnages are needed. For 100 tons and less, quotations are firm on both billet and rail bars.

Bolts, Nuts and Rivets.—Specifications from practically all manufacturers are lighter, the most marked decrease being from users of small rivets. Railroads continue to place orders at the rate of late June.

Bars.—Farm implement manufacturers, especially tractor builders, continue to fall behind in deliveries, in spite of the fact that many plants are operating well above their rated capacities. Specifications to mills from this source are fully maintained, and there is no lessening in the rate of steel used by the automobile trade, as judged by shipments from Chicago district mills. Orders from road machinery builders are smaller because the season has advanced to the point where contractors are more concerned with using equipment than in making purchases against work contemplated or on hand. Soft steel bar prices are unchanged at 2c., Chicago. Both new orders and specifications for iron bars have been heavier than at any time previously this year. Prices are steady at 2c., Chicago. Users of alloy steel bars continue to issue specifications at an undiminished rate and new purchases are keeping books well filled. Prices are firm and alloy differentials are being maintained. Specifications for rail steel bars, though lighter, still compare favorably with shipments. Production is being maintained at a high rate as producers bend their efforts to round out stocks. Barn equipment builders are busy. The bed trade is quiet, largely because of the Furniture Show, which is now in full swing. Brazed tubes, made from hard steel, cannot be had in less than five weeks.

Rail steel bar prices are steady at 1.85c., Chicago Heights.

Mill prices per lb.: Soft steel bars, 2c., base, Chicago; common bar iron, 2c., base, Chicago; rail steel bars, 1.85c., base, Chicago Heights mill.

Wire Products.—Producers have announced price cuts of $2 a ton on all wire products except barbed wire, which has been reduced $3 a ton. Wire nails are now quoted at $2.60 per keg, base Chicago, and plain wire is being quoted at $2.45 per 100 lb., base, in the local market. Demand from all classes of users is lighter, but mill operations have been cut only a trifle to 60 per cent of capacity, as producers find it advisable to rebuild stocks after the June business, which was the best June in several years. Jobbers for the most part have cleared the heavy stocks of nails built up earlier in the year and again are ordering from producers. Distributers in the South report business as dull. The country trade in the Middle West is still of fair size and in the Northwest it holds above the average of a year ago. Weather conditions in the last week have been favorable to the farmers. Specifications from the manufacturing trade are being issued at an undiminished rate. Prices for wire and wire products are given on page 105.

Sheets.—Prices are holding, but consumer interest is slow. Schedules were not greatly improved following the shutdown over the holiday last week. Hot weather is now having its effect on production. In some quarters it is believed that users are showing more interest in the market and that present low prices will soon induce buying in larger quantities.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 2.80c.; No. 24 galv., 3.65c.; No. 10 blue ann'l'd, 2.15c. Deliv'd prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than Chgo. deliv'd prices.

Coke.—Prices are firm at $8, f.o.b. local ovens, as second half contracting comes to a close. Summer inventory periods, hot weather and a reported slackening in demand for foundry products have so far had only a slight effect on the rate of coke shipments.

Old Material.—Cancellation of contracts and an unusually large number of rejections tell almost the whole story of the Chicago scrap market. Railroad shipments are heavy and there is a surplus of practically all grades. Steel mills are using less scrap and a larger portion of pig iron. Consumers throughout this district feel that there is an oversupply of scrap and that when they need additional tonnage they will buy it at least 50c. per ton below present levels. Dealers readily pay $9.50 a gross ton for cast iron borings and $12.50 for heavy melting steel.

Prices deliv'd consumers' yards, Chicago:

Per Gross Ton

Basic Open-Hearth Grades:	
Heavy melting steel	$12.25 to $12.75
Shoveling steel	12.25 to 12.75
Frogs, switches and guards, cut apart, and misc. rails	13.50 to 14.00
Hydraul. compressed sheets	11.00 to 11.50
Drop forge flashings	9.50 to 10.00
Forg'd, cast and r'l'd steel carwheels	15.25 to 15.75
Railr'd tires, charg. box size	15.50 to 16.00
Railr'd leaf springs, cut apart	15.50 to 16.00
Acid Open-Hearth Grades:	
Steel couplers and knuckles	13.75 to 14.25
Coil springs	15.75 to 16.25
Electric Furnace Grades:	
Axle turnings	12.50 to 13.00
Low phos. punchings	14.00 to 14.50
Low phos. plate, 12 in. and under	14.00 to 14.50
Blast Furnace Grades:	
Axle turnings	9.50 to 10.00
Cast iron borings	9.00 to 9.50
Short shoveling turnings	9.00 to 9.50
Machine shop turnings	6.00 to 6.50
Rolling Mill Grades:	
Iron rails	13.50 to 14.00
Rerolling rails	14.75 to 15.25
Cupola Grades:	
Steel rails less than 3 ft.	15.25 to 15.75
Angle bars, steel	14.25 to 14.75
Cast iron carwheels	12.75 to 13.25
Malleable Grades:	
Railroad	12.50 to 13.00
Agricultural	11.50 to 12.00
Miscellaneous:	
*Relay'g rails, 56 to 60 lb.	23.00 to 25.00
*Relay'g rails, 65 lb. and heav.	26.00 to 31.00

Per Net Ton

Rolling Mill Grades:	
Iron angles and splice bars	13.50 to 14.00
Iron arch bars and transoms	19.50 to 20.00
Iron car axles	23.50 to 24.00
Steel car axles	15.50 to 16.00
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	11.00 to 11.50
No. 1 busheling	9.50 to 10.00
No. 2 busheling	5.75 to 6.25
Locomotive tires, smooth	12.00 to 12.50
Pipes and flues	8.00 to 8.50
Cupola Grades:	
No. 1 machinery cast	13.50 to 14.00
No. 1 railroad cast	13.00 to 13.50
No. 1 agricultural cast	12.50 to 13.00
Stove plate	11.00 to 11.50
Grate bars	11.25 to 11.75
Brake shoes	10.50 to 11.00

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Rails and Track Supplies.—The Norfolk & Western has inquired for 37,000 tons of rails and the Northern Pacific for 15,000 tons. These are the forerunner of the fall buying movement. The Northern Pacific tonnage is for early 1929 requirements, but is asked for now so that a part can be shipped by water before the close of Lake navigation. Fully 3000 tons of track supplies will be needed with these rails, but this railroad will take close to 5000 tons to cover maintenance work. Users of light rails have ordered 1300 tons. Rail output in this district is at 60 per cent of capacity. Miscellaneous railroads have purchased a total of 1000 tons of track accessories in the week. The Cleveland, Cincinnati Chicago & St. Louis has added 800 tons of rails to its contract.

Prices f.o.b. mill, per gross ton: Standard-section open-hearth and Bess. rails, $43; light rails, rolled from billets, $36. *Per lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.25c.; angle bars, 2.75c.

Cast Iron Pipe.—Prices for cast iron pipe at $32, Birmingham, for 6 in. and larger diameters, are strong. In fact, some producers are naming $34. The National Cast Iron Pipe Co. has taken 1600 tons of 6 and 8-in. pipe for Chicago at $31.80, Birmingham, or $40, delivered. This contract carries with it an option to double the tonnage. The United States Cast Iron Pipe & Foundry Co. is reported to be low bidder at St. Paul. The National company has taken 250 tons for Grosse Isle, Mich., and the American Cast Iron Pipe Co. has been awarded 100 tons by Waukesha, Wis. Saginaw, Mich., will buy 4000 ft. of 30 and 36-in. pipe.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, $40.20 to $41.20; 4-in., $44.20 to $45.20; Class A and gas pipe, $4 extra.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforc'g bars, billet steel	2.30c. to 3.00c.
Reinforc'g bars, hard steel	2.00c. to 2.70c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands	3.65c.
Hoops	4.15c.
Black sheets (No. 24)	3.80c.
Galv. sheets (No. 24)	4.65c.
Blue ann'l'd sheets (No. 10)	3.35c.
Spikes, stand. railroad	3.55c.
Track bolts	4.55c.
Rivets, structural	3.60c.
Rivets, boiler	3.60c.
	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, sq., tap. or blank	60
Hot-pressed nuts, hex., tap. or blank	60
No. 8 black ann'l'd wire, per 100 lb.	$3.30
Com. wire nails, base per keg	3.10
Cement c't'd nails, base per keg	3.10

Link-Belt Catalog and Engineering Data Book

General catalog 500 has been published by Link-Belt Co., Chicago, Indianapolis and Philadelphia. It consists of 1088 pages and not only covers, in engineering data and list prices, the complete chain, sprocket, power transmission, elevating and conveying and engineering divisions of that company's business, but contains considerable data for which the engineer has use.

In developing this book, it was evidently the purpose not only to make its contents of engineering information so ample that engineers might design plants with materials-handling equipment of a standard character, but also to supply price lists so complete as to enable the experienced buyer to determine net prices of his purchases.

The Gulf States Steel Co. has ordered nine thermal expansion goggle valves, built by the William M. Bailey Co., Pittsburgh, under the patents of F. R. McGee, chief engineer, Mingo, Ohio, works, Carnegie Steel Co. More than 80 of these valves, which are used on blast furnace main gas lines, have been installed in the past year. The valve now being sold is an improvement over one employing the same thermal expansion principle, developed and patented by Mr. McGee about three years ago.

New York

Pipe Inquiry for 40,000 Tons—Building to Take 12,000 Tons of Steel

NEW YORK, July 10.—The pig iron market has shown relatively little activity so far this quarter. Inventory-taking among foundries is largely over, but operations in some plants have been adversely affected by the hot weather. It is estimated that 50 to 60 per cent of the melters in this district have covered their known pig iron needs for this quarter. Comparatively little second quarter pig iron remains unshipped, but in some cases melters overbought and accepted deliveries on all they purchased, with the result that they will have a carryover on their yards. Pig iron sales in this district during the week totaled about 7500 tons. The General Electric Co. has bought 500 tons of high-silicon malleable iron for its Elmira, N. Y., plant. The Crane Co., Bridgeport, Conn., is understood to have closed, in part, against an inquiry for 1200 tons of foundry iron. A New York district melter is in the market for 1000 tons of foundry iron. The Chapman Valve Mfg. Co., Indian Orchard, Mass., has divided an order for 1500 tons of foundry among the Mystic furnace, a Buffalo producer and a third interest. An inquiry for 2000 tons of ballast iron for delivery on the Pacific Coast is before the local trade. Buffalo foundry iron continues to range from $16 to $17, base furnace, but eastern Pennsylvania producers have announced a reduction of 50c. a ton to $19.50, base furnace. For some time they have shaded the market to that extent on sales in this district.

Prices per gross ton, deliv'd New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	$20.91 to $21.91
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	20.89 to 22.02
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	21.39 to 22.52
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	21.89 to 23.02

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.

Bars, Shapes and Plates.—In a rather dull market, with activity displayed by sellers rather than buyers, little progress has been made in establishing 1.90c., Pittsburgh, or 2.05c. at Eastern plate and shape basing points as the third quarter prices on bars, shapes and plates. Nearly all mills are willing to extend 1.85c. plate contracts into the third quarter, and although there is some active solicitation of bar business at 1.90c., the common practice is to make this quotation tentatively on prospective business and await developments. The bar market, however, shows somewhat more strength than either plates or shapes, prices on the latter product usually being nominal on account of the difference in basing points of the two largest interests and the keen competition on large and desirable tonnages. Of particular interest in the structural market is the Western Union Building in Manhattan, which will take about 12,000 tons of shapes. Another large job, for which inquiry will be made in the early fall, is the Kill Van Kull bridge connecting Staten Island and New Jersey, which will take from 30,000 to 40,000 tons. The Structural Steel Board of Trade reports June fabricated lettings in the metropolitan area as 38,100 tons, compared with 46,000 tons in May and 32,000 tons in June, 1927. These figures do not include bridges, subway work, etc. Lettings during the first half of 1928, amounting to 182,800 tons, registered a sharp decline from the 278,300 tons reported during the corresponding period last year.

Mill prices per lb., deliv'd New York: Soft steel bars, 2.19c. to 2.24c.; plates, 2.12½c. to 2.22½c.; struct. shapes, 2.14½c. to 2.19½c.; bar iron, 2.14c.

Warehouse Business.—Business so far this month is keeping up to the June rate, with activity fairly well distributed over all products. Sheets continue the weakest item, but there is nothing to indicate a further reduction in prices.

Reinforcing Bars.—About 1200 tons of bars will be required for a terminal warehouse in the Bronx for the Lehigh Valley Railroad. No other large pending projects have been reported, but reinforcing steel has not yet been purchased for a section of the subway, noted last week as about to be placed. The Long Island City post office, requiring 275 tons, has gone to the Kalman Steel Co. Most distributers are now quoting 1.90c., Pittsburgh mill, with 2c. occasionally obtainable on small tonnages. Warehouse prices are unchanged.

Pipe.—Interest is centered in a Western pipe line project, requiring approximately 435 miles of 10¾-in. o.d. oil pipe, or about 40,000 tons, which may be placed immediately by a Standard Oil subsidiary. Considerable tonnage of standard butt-weld pipe is being taken in this district, with prices apparently regular and the demand steady.

Sheets and Strips.—The sheet market seems to have become somewhat stabilized, but at levels which are far from satisfactory to the mills. The galvanized material is being sold to jobbers at 3.40c.; Pittsburgh, with the general run of small orders at $2 a ton higher. Black sheets are fairly steady at 2.65c., but concessions of $1 a ton are occasionally to be had on attractive lots. On the blue annealed product, 2c., Pittsburgh, is representative of the market, with the mills not disposed to go lower under ordinary conditions. Consumers are not anxious to place orders and any irregularity in these prices on all sheet business can be traced to mill competition rather than the pressure of buyers. There is little demand for strip steel. The cold-rolled product is selling at a range from 2.75c. to 3c., Pittsburgh, and 1.85c. is the minimum on the hot-rolled material.

Wire Products.—Reductions by the leading producer of $2 a ton on nails, staples and wire and $3 on barbed wire have been followed by most makers and have done much to clarify the price structure on these products. In some respects the move merely amounts to a formal recognition of

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.30c.
Soft steel bars, small shapes	3.25c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin. shafting and screw stock—	
Rounds and hexagons	3.40c.
Flats and squares	3.90c.
Cold-roll. strip, soft and quarter hard	5.15c. to 5.40c.
Hoops	4.50c.
Bands	4.00c.
Blue ann'l'd sheets (No. 10)	3.85c. to 3.90c.
Long terne sheets (No. 24)	5.60c. to 5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.
	Per Cent Off List
Machine bolts, cut thread:	
¾ x 6 in. and smaller	55 to 60
1 x 30 in. and smaller	50 to 50 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	55 to 60
¾ x 20 in. and smaller	50 to 50 and 10
Coach screws:	
½ x 6 in. and smaller	55 to 60
1 x 16 in. and smaller	50 to 50 and 10
Boiler Tubes—	Per 100 Ft.
Lap welded, 2-in.	$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discount on Welded Pipe

Standard Steel—	Back	Galv.
⅛-in. butt	46	29
¾-in. butt	51	37
1-3-in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
¼-in. butt	5	+19
¾-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per Box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 x 20 in.)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	3.60c. to 3.80c.
No. 22	3.75c. to 3.95c.
No. 24	3.80c. to 4.00c.
No. 26	3.90c. to 4.10c.
No. 28*	4.05c. to 4.25c.
No. 30	4.30c. to 4.50c.

Sheets, Galvanized

	Per Lb.
No. 14	4.15c. to 4.35c.
No. 16	4.00c. to 4.20c.
No. 18	4.15c. to 4.35c.
No. 20	4.30c. to 4.50c.
No. 22	4.35c. to 4.55c.
No. 24	4.50c. to 4.70c.
No. 26	4.75c. to 4.95c.
No. 28*	5.00c. to 5.20c.
No. 30	5.40c. to 5.60c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

prices which some mills have been quoting for months. Wire is now quoted at 2.40c., Pittsburgh, wire nails at 2.55c., and galvanized barbed wire at 3.20c. Wire rods are unchanged at $42 a ton, Pittsburgh base. Woven wire fencing remains at $65 a ton to retailers.

Cast Iron Pipe.—The tendency toward a stiffening of prices is accentuated by an advance of $2 a ton by one Southern maker, announced as effective Monday, July 9, on all new business. This company is now quoting $33 to $35, base Birmingham, compared to a previous schedule of $32 to $33. Northern foundries continue to quote a range of $37.60 to $38.60, delivered New York, practically closing the market to their Southern competitors. Business continues rather dull in municipal as well as private enterprises. Valhalla, N. Y., will take bids on July 18 for 1500 tons of 6 to 16-in., classes C and D pipe, and Washington will close July 11 on 3000 tons of 8 to 16-in. class B pipe.

Prices per net ton, deliv'd New York: Water pipe 6-in. and larger, $37.60 to $38.60; 4-in. and 5-in., $42.60 to $43.60; 3-in., $52.60 to $53.60; Class A and gas pipe, $4 to $5 extra.

Coke.—The market is very quiet, with prices unchanged at $3.50 per ton, Connellsville, for standard foundry coke and $2.50 to $2.75 for the furnace grade. Special brands of foundry coke are quoted at $4.85, f.o.b. ovens, and delivered prices are: To northern New Jersey, Jersey City and Newark, $8.56 per net ton; to New York and Brooklyn, $9.44 per net ton. By-product foundry coke is unchanged at $9 to $9.40 per net ton, Newark or Jersey City, and $10.06 to $10.29, New York or Brooklyn.

Old Material.—Weakness in buying prices has become more pronounced during the last week, particularly in iron and steel car axles and No. 1 heavy breakable cast, on which reductions of from 75c. to $1.25 a ton have been made. No. 1 heavy melting steel is commanding $12.50 per ton, delivered, and is somewhat more active than other grades in a very quiet market.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel.	$9.50 to	$9.85
Heavy melting steel (yard)	6.25 to	7.00
No. 1 hvy. breakable cast.	10.50 to	11.00
Stove plate (steel works)..	7.00 to	7.25
Locomotive grate bars...	7.00 to	7.50
Machine shop turnings...	6.00 to	6.50
Short shoveling turnings..	6.00 to	6.50
Cast borings (blast furn. or steel works).....	6.00 to	6.50
Mixed borings and turnings	6.00 to	6.50
Steel car axles.....	13.50 to	14.00
Iron car axles.....	23.00 to	23.50
Iron and steel pipe (1 in. dia., not under 2 ft. long)		8.25
Forge fire.....	6.50 to	6.75
No. 1 railroad wrought....	9.50 to	10.00
No. 1 yard wrot., long....	8.00 to	8.50
Rails for rolling.....	10.00 to	10.50
Cast iron carwheels.....	11.00 to	11.50
Stove plate (foundry)....	8.50 to	9.00
Malleable cast (railroad).		10.00
Cast borings (chemical)..	10.75 to	11.25

Prices per gross ton, deliv'd local foundries:

No. 1 machy. cast.....	$14.00 to	$15.00
No. 1 hvy. cast (columns bldg. materials, etc.), cupola size.....	12.00 to	13.00
No. 2 cast (radiators, cast boilers, etc.).....	11.50 to	12.50

Philadelphia

Foundry Iron Down 50c. a Ton—Extension of Second Quarter Steel Contracts Quite General

PHILADELPHIA, July 10.—A decline of 50c. a ton in the price of eastern Pennsylvania foundry pig iron is the first change in that grade since last February. Aside from the reductions of $2 a ton on wire products, excepting woven wire fencing, and a decline of $1 a ton on rerolling billets, the steel price situation is virtually unchanged. Steel mills in the East and in the Pittsburgh-Youngstown district have quite generally extended second quarter contracts and second quarter prices on plates, shapes and bars into this quarter, so that the $1 a ton advance has not applied except to the occasional buyer or on very small lots. Scrap prices are so low as to afford little margin for the shippers, yet the quantities available seem to be sufficient for all needs.

Pig Iron.—With Buffalo foundry iron selling at $21 or less, delivered in and around Philadelphia, eastern Pennsylvania furnaces have recently lost business at their very doorsteps, and to meet this situation they have reduced asking prices 50c. a ton, or to $19.50 on the base grade, f.o.b. furnace. This means a delivered price in Philadelphia of $20.26 for the No. 2 grade, $20.76 for No. 2X and $21.26 for No. 1X. Buffalo iron is being offered by one or two makers at $16 to $16.50 for No. 2 or No. 2X and at $16.75, furnace, for No. 1X, though for carload lots higher prices are frequently quoted. Sales of foundry iron in this district have amounted only to a few thousand tons in the last week and carload lots have predominated. Many melters are still taking in iron on second quarter contracts. There has been little third quarter contracting. The largest inquiry is for 3000 to 5000 tons of low phosphorus iron for the Standard Steel Works Co., Burnham, Pa.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.....		$20.26
East. Pa. No. 2X, 2.25 to 2.75 sil.....		20.76
East. Pa. No. 1X.....		21.26
Basic (del'd east. Pa.)...	$19.00 to	19.50
Gray forge	19.75 to	20.25
Malleable	21.00 to	21.50
Stand. low phos. (f.o.b. N. Y. State furnace)...	22.00 to	23.00
Cop. b'r'g low phos. (f.o.b. furnace)	23.50 to	24.00
Va. No. 2 plain, 1.75 to 2.25 sil.		24.54
Va. No. 2X, 2.25 to 2.75 sil.		25.04

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

Ferromanganese.—Small users of ferromanganese have quite generally covered their requirements for the last half, but most of the large consumers have made no contracts, and are amply taken care of by shipments against their first half commitments. The price for domestic and imported alloy continues at $105, seaboard, for spot shipment or on contract.

Billets.—Some mills have reduced prices $1 a ton on open-hearth rerolling billets for the more attractive lots, now quoting $32, Pittsburgh. This reduction has not disturbed the price of forging billets so far as Eastern mills are concerned; it remains at $38, Pittsburgh. Nor will some mills sell high-carbon billets at the $32 base.

Plates.—Day-to-day orders for plates, mostly small, are sufficient to maintain operations of Eastern mills at 50 to 60 per cent. Plates are commonly selling at 2.10c., Philadelphia, which was the second quarter price, but on some small lots mills are obtaining 2.15c., Philadelphia, the figure at which third quarter contracts were to have been taken. However, the extension of second quarter contracts has been so general that none but the small or occasional buyer is paying more than 2.10c., delivered here. This price is based on 2c., Coatesville.

Structural Material.—Building work continues fairly active. Among the week's awards were a garage and office building in Philadelphia, 2200 tons; a bank building at Wilkes-Barre, Pa., 1100 tons, and a coal breaker at Plymouth, Pa., 1800 tons. The Bethlehem Steel Co. has been awarded the contract for a power house for the Haddon Hall-Chalfonte Hotel, Atlantic City, which is to be welded in the field; 600 tons of steel will be required. Current prices for plain material are usually based on 2c., Pencoyd, or 2.06c., Philadelphia, for carload lots, and 2.08c., Philadelphia, for less than carloads, but $1 a ton below and above 2c., Pencoyd, have been done. Second quarter contracts have been extended in most

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier..	2.50c. to 2.60c.
Plates, ⅜-in.	2.80c. to 3.00c.
Structural shapes	2.40c. to 2.60c.
Soft steel bars, small shapes, iron bars (except bands).....	2.60c.
Round-edge iron.....	3.50c.
Round-edge steel, iron finished 1½ x 1½ in.....	3.50c.
Round-edge steel, planished.....	4.30c.
Reinforc. steel bars, sq. twisted and deform.	2.50c. to 3.00c.
Cold-fin. steel, rounds and hex....	3.35c.
Cold-fin. steel, sq. and flats.....	3.85c.
Steel hoops	3.50c.
Steel bands, No. 12 to ⅛-in., inclus.	3.25c.
Spring steel.....	5.00c.
*Black sheets (No. 24).....	3.85c.
†Galvanized sheets (No. 24).....	4.60c.
Blue ann'l'd sheets (No. 10).....	3.15c.
Diam. pat. floor plates—	
¼-in.	*5.30c.
⅜-in.	5.50c.
Rails	3.20c.
Swedish iron bars.....	6.60c.

*For 50 bundles or more; 10 to 49 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.
†For 50 bundles or more; 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.

cases, so that the prices announced for third quarter have had little effect. Eastern shape mills are operating at 65 to 75 per cent.

Bars.—The asking price for steel bars is 1.90c., Pittsburgh, but current orders are being accepted by some mills at 1.85c., and second quarter contracts made at 1.85c. have been extended in so many cases that the 1.90c. price applies only on the occasional small lots. Bar iron is quoted usually at 1.80c., Pittsburgh, or 2.12c., Philadelphia, but concessions of $1 a ton are given on the more attractive orders.

Sheets.—Blue annealed sheet sales are being made at 2c., 2.05c. and 2.10c., Pittsburgh, but the larger buyers are not paying above 2c. Black sheets remain at 2.60c. to 2.65c. and galvanized at 3.50c., Pittsburgh.

Warehouse Business.—Sales by local jobbers in June were fairly satisfactory. The price situation is more stable than at any time in months.

Imports. — The week's receipts from abroad included 6000 tons of iron ore from Algeria, 500 tons of manganese ore from Java, 314 tons of structural shapes from Germany, 92 tons of bars from Sweden, 21 tons of bands from Belgium and 19 tons of bands from Germany.

Old Material.—Notwithstanding the low prices at which many grades of scrap are being sold, there is a plentiful supply. There has been no recent buying of heavy melting steel, but one mill took in a small tonnage of scrap rails at $13, delivered. A broker is paying $12.50, delivered Bethlehem, for heavy melting steel against a $13 order. Bundled sheets have been sold at $9.50 and machine shop turnings at $10. While the price tendency is downward, the changes in the past week have been slight.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$13.00 to $13.50
Scrap T rails	12.50 to 13.00
No. 2 heavy melting steel	10.50 to 11.00
No. 1 railroad wrought	13.50 to 14.50
Bundled sheets (for steel works)	9.50 to 10.00
Machine shop turnings (for steel works)	10.00 to 10.50
Heavy axle turnings (or equiv.)	12.00 to 13.00
Cast borings (for steel works and roll. mill)	10.00 to 10.50
Heavy breakable cast (for steel works)	14.50 to 15.00
Railroad grate bars	11.00 to 11.50
Stove plate (for steel works)	11.00
No. 1 low phos., hvy., 0.04% and under	17.50 to 18.00
Couplers and knuckles	14.50 to 15.00
Rolled steel wheels	14.50 to 15.00
No. 1 blast f'nace scrap	9.50 to 10.00
Wrot. iron and soft steel pipes and tubes (new specific.)	12.00 to 12.50
Shafting	17.00 to 17.50
Steel axles	19.00 to 20.00
No. 1 forge fire	11.00
Cast iron carwheels	15.50 to 16.00
No. 1 cast	15.50 to 16.00
Cast borings (for chem. plant)	14.50 to 15.00
Steel rails for rolling	14.50 to 15.00

The Concrete Reinforcing Steel Institute will hold its fall 1928 meeting at Buckwood Inn, Shawnee-On-Delaware, Pa., Oct. 1 to 3, inclusive.

Cleveland

Second Quarter Prices on Plates, Shapes and Bars Renamed —Wire Products Reduced $2 a Ton

CLEVELAND, July 10.—The uncertainty of the price situation on steel bars, plates and structural material for the third quarter has been relieved by the rather common renaming of the second quarter price of 1.85c., Pittsburgh, after some of the producers had made an earnest effort to get prices on a basis $1 a ton higher. Not many contracts had been taken at the advance and the 1.90c. price evidently will apply only to small-lot buyers. Cleveland bar mills are quoting 1.85c., f.o.b. Cleveland, for the quarter. Many consumers have withheld contracts, awaiting the definite establishment of the market, and considerable contracting is now expected.

There are increasing evidences in the market of a tendency toward price equalization and readjustment, which apparently is being brought about by the establishment of other producing centers than Pittsburgh as basing points. In this connection there is talk of an advance of the Cleveland base on steel bars to $2 a ton above the Pittsburgh base. Cleveland bar mills have been using the Pittsburgh price f.o.b. Cleveland.

The price situation was further clarified during the week by the announcement of reductions on wire products and wire rods. With the new prices there is a real reduction on wire, but the new prices on nails have appeared on sales by some makers recently.

From the standpoint of demand, the most interesting feature of the market is the good volume of specifications that continues to come from the automotive industry and which exceeds expectations. Steel is being ordered quite freely by some of the automobile makers, who are bringing out new models, and by builders of low-priced cars, who are keeping up good production during a period when there is usually a marked seasonal decline.

New business was rather light during the week. Some of the plate mills took a moderate volume of small orders at 1.85c. In the structural field considerable bridge work is in prospect. The Cleveland Union Terminals Co. today took bids on 4000 tons, this being part of the steel recently inquired for grade crossing elimination work.

Pig Iron.—The market was somewhat less active the past week than during the few previous weeks, which probably was partly owing to the holiday. Sales by Cleveland interests during the week amounted to 19,000 tons. A few fair-sized lots of foundry and malleable iron were placed in the Cleveland territory, including a purchase from Cleveland furnaces by the Westinghouse Electric & Mfg. Co., for its Cleveland plant. There is not much activity in Michigan. The automobile industry in that State has been rather slow in coming into the market for the third quarter. However, shipments to automobile foundries are holding up well, some of them against contracts carried over from the second quarter. There are virtually no changes in prices. While one local producer is holding at $16.50 for foundry and malleable iron for outside shipment, Lake iron is still available at $16.25 or lower for shipment to highly competitive points. Foundry iron can be had at $16.50 in the Valley district, although one producer made several sales during the week at $17. Some Valley iron is being sold at that price in Cleveland for mixture purposes, although the cost to the consumer is 76c. more a ton than on local iron. The market is firm in Michigan at $17.50. The basic market is inactive. Shipments this month have started out in about the same volume as during June.

Prices per gross ton at Cleveland:

N'th'n fdy., sil. 1.75 to 2.25	$18.00
S'th'n fdy., sil. 1.75 to 2.25	21.50
Malleable	18.00
Ohio silvery, 8 per cent	28.00
Basic Valley furnace	16.00
Stand. low phos., Valley furn.	26.50

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; $3 from Jackson, Ohio; $6 from Birmingham.

Semi-Finished Steel.—A price reduction of $2 a ton to $42, Cleveland, is announced on wire rods. There had been some shading recently to this price.

Sheets.—Prices are holding at recent levels, having reached a point below which producers are not inclined to go, and effort is being made to get quotations on a slightly higher basis. Some contract tonnage was taken during the week at 2.60c. for black sheets, although 2.65c. is the more common price. On galvanized sheets 3.50c., Pittsburgh, appears to be the top of the market, but some business is going at 3.40c., Pittsburgh, and 3.45c., Valley. Blue annealed sheets are steady at

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and struct. shapes	3.00c.
Soft steel bars	3.00c.
Reinforc. steel bars	2.25c. to 2.75c.
Cold-fin. rounds and hex	3.65c.
Cold-fin. flats and sq	4.15c.
Hoops and bands	3.65c.
Cold-finished strip	*5.95c.
Black sheets (No. 24)	3.75c.
Galvanized sheets (No. 24)	4.40c. to 4.50c.
Blue ann'l'd sheets (No. 10)	3.25c.
No. 9 ann'l'd wire, per 100 lb	$2.85
No. 9 gal. wire, per 100 lb	3.30
Com. wire nails, base per keg	2.85

*Net base, including boxing and cutting to length.

1.90c. to 2c., Pittsburgh. Small lots in some cases bring 2.10c.

Strip Steel.—The demand for hot-rolled strip is holding up quite well, particularly for narrow material. Regular prices on narrow strip are well maintained, but large consumers of 6-in. and wider strip are getting shipments at net prices that figure back to 1.75c., Pittsburgh, or lower. Mills that have taken contracts at the regularly quoted prices complain that they are not getting specifications. Large consumers of cold-rolled strip are able to place orders at 2.65c., Cleveland, for 3 tons and over.

Wire Products.—Irregularities that have existed for some time in prices on wire nails have been recognized by a price reduction of 10c. per keg to $2.55, Cleveland and Pittsburgh, which has recently been a common price. A similar reduction to 2.40c. per lb. has been made on plain wire, which has been holding fairly firm at the former price. Other wire products are correspondingly reduced. On barbed wire the reduction is $3 a ton.

Reinforcing Bars.—The Cleveland Union Terminals Co. is inquiring for several hundred tons for buildings being erected in connection with the terminal development. Rail steel bars are unchanged at 1.75c., mill.

Iron Ore.—On July 1 there was 5,067,786 tons of Lake Superior ore on Lake Erie docks, compared with 5,050,692 tons on the same date a year ago.

Fluorspar.—The $1 a ton advance on gravel fluorspar to $17 mines has been generally adopted. While some small lots have been sold at the advance, not much activity is expected during the remainder of the year, as most consumers are under contract.

Semi-Finished Steel.—Specifications continue in good volume. The leading local producer is still operating its plant at 100 per cent of capacity. Local prices are unchanged at $32.50 to $33, Cleveland, for sheet bars, billets and slabs.

Coke.—Foundry coke shipments against contracts are fair, but there is little new demand. Buying is from hand to mouth. Connellsville foundry coke is available at as low as $3.25 per ton, with quotations ranging up to $4.85 for the base grades. Ohio by-product coke is quoted at $7.75, Painesville, for July shipment.

Alloy Steel.—Orders have come out this month better than had been expected and better than during much of June. Some specifications are coming from automobile companies that are anxious for early delivery. Prices are being maintained.

Bolts, Nuts and Rivets.—Several of the automobile companies are ordering bolts and nuts freely and specifications on the whole are quite satisfactory. Rivets are moving in somewhat larger volume than recently. Most buyers have placed contracts at regular prices.

Old Material.—Activity during the week was confined to a limited amount of buying by dealers to cover against contracts. The market lacks strength. Machine shop turnings, which advanced recently when a purchase by a Cleveland mill created a local demand, have declined 25c. a ton, dealers making some purchases at $7.25. Odd lots of No. 1 heavy melting steel are being picked up by dealers at $13. Blast furnace grades are holding at the recently reduced prices. Cast scrap is weak.

Prices per gross ton, deliv'd consumers' yards:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$13.00 to $13.25
No. 2 heavy melting steel	12.50 to 12.75
Compressed sheet steel	12.50 to 13.00
Light bundled sheet stamp'gs	11.50 to 11.75
Drop forge flashings	11.50 to 11.75
Machine shop turnings	7.00 to 7.25
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	13.50 to 13.75
No. 1 busheling	11.00 to 11.25
Pipes and flues	9.00 to 9.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades	
Low phos. forging crops	16.50 to 17.00
Low phos., billet, bloom and slab crops	17.00 to 17.50
Low phos. sheet bar crops	16.50 to 17.00
Low phos. plate scrap	16.00 to 16.50
Blast Furnace Grades	
Cast iron borings	9.00 to 9.25
Mixed bor'gs and short turn'gs	9.00 to 9.25
No. 2 busheling	9.00 to 9.25
Cupola Grades	
No. 1 cast	16.00 to 16.50
Railroad grate bars	11.00 to 12.00
Stove plate	12.00 to 12.50
Rails under 3 ft	16.75 to 17.25
Miscellaneous	
Railroad malleable	15.00 to 15.50
Rails for rolling	16.25 to 16.50

Steel Corporation's Orders Increased in June

Unfilled orders on the books of the United States Steel Corporation increased during June. The total on June 30 was 3,637,009 tons, compared with 3,416,822 tons on May 31—an increase for June of 220,187 tons. This compares with 3,053,246 tons on June 30, 1927. The table gives the reported figures for the past 18 months.

	1928	1927
Jan. 31	4,275,947	3,800,177
Feb. 28	4,398,189	3,597,119
Mar. 31	4,335,206	3,553,140
April 30	3,872,133	3,456,132
May 31	3,416,822	3,050,941
June 30	3,637,009	3,053,246
July 31	.....	3,142,014
Aug. 31	.....	3,196,037
Sept. 30	.....	3,148,113
Oct. 31	.....	3,341,040
Nov. 30	.....	3,454,444
Dec. 31	.....	3,972,874

At the end of April, 1917, the highest total in unfilled orders of the Steel Corporation ever attained was reported at 12,183,193 tons. The lowest figure ever reported was 2,754,757 tons, Dec. 31, 1910.

The Pratt & Whitney Aircraft Co., Hartford, Conn., has received an additional order for 72 airplane engines and numerous spare parts from the United States Army, deliveries to run into next spring. It is the largest individual order for motors received by the company from the Army and involves $671,620.

Steel Corporation Sues for Over-Payment of Federal Taxes

The time limit within which the United States Steel Corporation and affiliated corporations could file suits for refunds of over-payments of Federal income and profits taxes paid for the year 1917, expired on July 8. The claims of the corporation and its affiliated corporations for refunds of such taxes have been pending for some time and have been under consideration by the Treasury Department, but due to the magnitude of the task of auditing the returns sufficient time to conclude them has not been available before the expiration of the statute of limitations, July 8. Hence, in order to fully protect its rights, the corporation and its affiliated corporations filed suits in the United States Court of Claims for the refunds they deem lawfully due.

The United States Steel Corporation and affiliated corporations paid approximately $468,000,000 Federal income and profits taxes for 1917 and 1918. This sum, it is understood, amounts to approximately 8.8 per cent of the total corporate income and profits taxes paid to the United States for the two years stated.

Farm Implement Plant Purchased by Case Company

The J. I. Case Threshing Machine Co., Racine, Wis., has acquired the Emerson-Brantingham Corporation's Rockford, Ill., farm machinery plant and inventories, including widely distributed branch houses, and as noted elsewhere in this issue, takes over operation of this branch of the company Aug. 1, according to an announcement by Charles S. Brantingham, president of the corporation. The Emerson-Brantingham Corporation will continue and expand its industrial products division. The Case purchase rounds out that company's line of threshing machines, farm tractors and combines to include plow, tillage and harvesting machines. The Rockford plant is expected to be considerably expanded under the Case operation.

"On Land—On Water—In the Air," an attractive 24-page booklet issued recently by the Niles-Bement-Pond Co., 111 Broadway, New York, outlines in narrative form how the machine tools, cranes, measuring devices, small tools, gears and other equipment manufactured by the company have met the developing needs of the railroad, the automobile plant, the marine engine shop, the shipyard and the airplane engine shop. Photographs of several of the company's products, with appropriate captions, are reproduced on alternate pages.

Boston

More Active Export Demand for Scrap—Foundry Melt Affected by Inventory-Taking

BOSTON, July 10.—Interest in the pig iron market centers in an inquiry from a western Massachusetts foundry for 2500 tons of No. 2 plain, No. 2X and No. 1X for third and fourth quarter delivery, which probably will be placed this week. Current bookings are confined to car lots, with Buffalo stacks securing the bulk of business. No. 2X Buffalo iron is freely offered at $16.50 a ton, on cars furnace, and producers east of Buffalo are meeting that price on a delivered basis. Some sales of Buffalo No. 2X were made during the week, however, at $17 a ton, furnace, and No. 1X was sold at $17.50, melters ignoring lower prices to obtain certain brands. A fair tonnage of Indian iron has been sold for deliveries running as far ahead as next October.

Foundry iron prices per gross ton deliv'd to most New England points:

Buffalo, sil. 1.75 to 2.25	$20.91 to $21.91
Buffalo, sil. 2.25 to 2.75	21.41 to 22.41
East. Penn., sil. 1.75 to 2.25	23.15 to 23.65
East. Penn., sil. 2.25 to 2.75	23.65 to 24.15
Va., sil. 1.75 to 2.25	25.71
Va., sil. 2.25 to 2.75	26.21
Ala., sil. 1.75 to 2.25	22.41 to 24.27
Ala., sil. 2.25 to 2.75	22.91 to 24.77

Freight rates: $4.91 from Buffalo, $3.65 from eastern Pennsylvania, $5.21 all rail from Virginia, $6.91 to $8.77 from Alabama.

Coke.—With many New England foundries taking inventory and with the industry collectively operating at not more than 65 per cent of capacity, specifications against last half contracts for by-product foundry coke have grown fewer and New England ovens have caught up on deliveries. New England-made fuel is still $11 a ton, delivered, within a $3.10 freight rate zone. Since dealers are well stocked with domestic coke, both for immediate and future requirements, the market is less active.

Imports.—June imports of pig iron at this port amounted to 800 tons, consisting of 700 tons Indian, 50 tons of Scotch and 51 tons of Dutch iron. This compares with 248 tons imported in May, this year; 1848 tons in June, last year; 4936 tons in June, 1926; and 7967 tons in June, 1925. Imports of ore in June totaled 18,731 tons, made up of 7000 tons from Bizerta, Tunis, 5981 tons from Huelva, Spain, and 5750 tons from Benisaf, Algiers, whereas May imports were 16,828 tons, and those for June, last year, 8300 tons.

Shapes and Plates.—While mills are still quoting 1.90c. per lb., base Pittsburgh, for shapes and plates, they are still protecting the largest New England consumers on third quarter deliveries at second quarter prices. Competition among fabricators is still keen, and they are making low bids on the most attractive tonnages offered. The current week should be a fairly active one in the fabricated steel market. Five Boston & Maine Railroad bridges, requiring 3000 tons of steel, will be awarded, while bids will go in on a number of fairly large tonnages.

Warehouse Business.—There has been a seasonal letdown in the movement of iron and steel out of warehouses, but the weekly turnover averages slightly more than a year ago. Warehouses generally are carrying well assorted but not large stocks, depending on the mills for replenishment. Prices are firm, reports of shading being fewer than they have been in months. It is stated that higher prices on cut nails are in the making.

Cast Iron Pipe.—The Warren Foundry & Pipe Co. has been awarded 100 tons of 6-in. and 8-in. pipe by Chelsea, Mass., and an equal tonnage by Marlboro, Mass. No other municipal lettings are reported, and private business is still quiet. Prices on small pipe are holding up well, but larger diameters can be purchased at concessions from regular prices. The market for 4-in. pipe is $45.10 to $46.10 a ton, delivered common Boston freight rate points, and for 6-in. to 12-in., $41.10 to $42.10. The usual $5 differential is asked on class A and gas pipe.

Old Material.—With one steamer loading 4000 to 5000 tons of steel for Danzig delivery and another scheduled to load within a fortnight, the export market is more active. No. 1 export steel is being taken at $9 to $9.25 a ton on dock here, and No. 2 at $8.75 to $9. The American Steel & Wire Co. has taken additional lots of long bundled skeleton at $9.50 a ton, Worcester, Mass. Steel turnings for Pennsylvania steel mill use have been sold at $5 on cars, shipping point, and for blast furnace use at $5 to $5.50, while a Norwood, Mass., foundry has bought stove plate at $10.50 a ton, delivered. One sale of forge flashings is reported at $6.10 a ton on cars, shipping point, but the general market appears to be $6.50 to $7. The movement of chemical borings is holding up well, with prices somewhat lower than a week ago. No. 1 heavy melting steel shipments are light, with most transactions at $8.10 on cars, shipping point.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$8.00 to $8.50
Scrap T rails	8.00 to 8.50
Scrap girder rails	7.50 to 8.00
No. 1 railroad wrought	9.00 to 9.50
No. 1 yard wrought	7.00 to 7.50
Machine shop turnings	5.00 to 5.50
Cast iron borings (steel works and rolling mill)	5.10 to 5.60
Bundled skeleton, long	6.50 to 7.00
Forge flashings	6.50 to 7.00
Blast furnace borings and turnings	5.00 to 5.50
Forge scrap	5.50 to 6.00
Shafting	12.00 to 12.50
Steel car axles	14.50 to 15.00
Wrought pipe 1 in. in diameter (over 2 ft. long)	7.00 to 7.50
Rails for rolling	9.50 to 10.00
Cast iron borings, chemical	9.50 to 10.00

Prices per gross ton deliv'd consumers' yards:

Textile cast	$13.50 to $14.00
No. 1 machinery cast	14.00 to 14.50
No. 2 machinery cast	12.50 to 13.50
Stove plate	10.00 to 10.50
Railroad malleable	13.50 to 14.50

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars, small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway round	6.60c.
Norway, squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tie steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hex	*3.45c. to 5.45c.
Squares and flats	*3.95c. to 6.95c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.50c.

	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot pressed nuts	50 and 5
Cold-punched nuts	50 and 5
Stove bolts	70 and 10

*Including quantity differentials.

Youngstown

Sheet and Tin Plate Mills Active This Week—July-August Ingot Output May Average 70 Per Cent

YOUNGSTOWN, July 10.—Following the holiday interruption, steel companies resumed production this week on a much broader basis, approaching in active steel sheet capacity the year's record scheduling, with 115 of 127 mills under power. Tin plate mills are active at a rate close to capacity, while there has been an appreciable gain in the rolling of hot-strip steel. Leading producers are inclined to believe that production with mid-West independents will average 70 per cent during July and August, comparing with dips in previous years during these two months to as low as 55 per cent. Current independent merchant bar schedules are not above 60 per cent, but represent a gain as compared with last year, when independent output did not top 35 per cent at this season.

One direct result of the proposal to build a 20-mile railroad spur linking the Youngstown industrial district with the Ohio River is expected to be a reduction in freight rates on coal shipped into Youngstown and Campbell from the western Pennsylvania fields. Principal carriers are considering such a plan. One of the district's leading freight traffic managers

estimates that each year from 9,000,000 to 10,000,000 tons of coal is shipped by rail into the Youngstown area. By utilizing the proposed 20-mile railroad, it would be possible to ship much of this fuel by barge down the Monongahela and Ohio Rivers, operating throughout the winter as well as during the warmer months. District steel companies are giving more attention to rate problems this year than ever before, in their efforts to reduce costs and place the district on a more advantageous competitive basis.

The Youngstown Sheet & Tube Co. and the Republic Iron & Steel Co. average 70 per cent this week. The former, which has been the recipient of two important pipe orders, involving line pipe in lapweld sizes of steel tubes, has not yet transferred such business to its operating departments. These two orders will materially help the company to maintain a better average operating rate in its tube mill department. Its No. 9 lapwell mill, rolling tubes up to 20-in., has again been placed in action, following idleness of several weeks.

Operations of the Republic company's tube mill department have been low. The Republic company has been making heavy shipments of buttweld pipe for construction and to jobbing interests.

Youngstown district tube producers have been rather hard hit by curtailment in oil well drilling, and by the drilling of heavy production wells, which has been responsible for curtailment in drilling operations.

In connection with its Brier Hill plate mills at Mosier, near Youngstown, the Sheet & Tube company has considered the installation of capacity for producing electrically welded pipe, utilizing steel plates.

This week 12 of 20 Valley tube mills are in action; 37 of 53 independent open-hearth furnaces are melting. The Newton Steel Co., producing highly finished sheets, has resumed at a near capacity rate after one week's suspension. High temperatures throughout the mid-West resulted in some loss of production in hot mills.

One of the district's leading fabricating concerns is working on a large order for brake drums for the new Ford car, and is also turning out heavy production of pressed steel parts for washing machines.

The General Pressed Steel Co. has about completed its plant at Newton Falls, and is planning to begin operations.

Earnings statements of district primary steel producers are expected to show up better for second quarter than for first quarter, contrary to expectations. The quarterly financial statement of the Sheet & Tube company will be released the latter part of July. Directors of the Republic Iron & Steel Co. will meet July 18 to consider the second quarter statement of earnings.

Cincinnati

Pig Iron Prices Steady but Demand Light—Scrap Firm in View of Lack of Buying Interest

CINCINNATI, July 10. — Quietness still prevails in pig iron sales, which in the week have totaled less than 2500 tons. Shipments on contracts are going forward at a moderate rate, but inquiries are scarce. A Hamilton, Ohio, melter is expected to buy 5000 tons of foundry iron for delivery during the last half, with the privilege of extending deliveries into the first three months of 1929. There has been no change in prices. Southern iron is firm at $15.50, base Birmingham, but the tonnage moving north of the Ohio River is negligible. Northern Ohio foundry ranges from $16 to $16.50, base furnace, while foundry iron from the Ironton district is quoted at $18 to $19, base Ironton.

Prices per gross ton, deliv'd Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$19.89
So. Ohio malleable	$20.14 to 20.89
Ala. fdy., sil. 1.75 to 2.25	19.19
Ala. fdy., sil. 2.25 to 2.75	19.69
Tenn. fdy., sil. 1.75 to 2.25	19.19
So'th'n Ohio silvery 8 per cent	26.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Finished Material.—Following closely on the heavy specifications placed against old contracts previous to the closing of the second quarter has come a lessened demand from consumers, a development not at all surprising to producers, who are fairly well satisfied with the trend of business. Prices are the strongest in many weeks and the situation in this respect is a source of encouragement to the manufacturers. Eastern mills have announced that common wire nails have been advanced to a minimum of $2.69 per keg, delivered in Cincinnati, which is equivalent to $2.55 at Ironton plus a 14c. barge rate to this city. Plain wire is firm at $2.40 per 100 lb., base Ironton. Representatives of Eastern companies declare that no concessions will be made from these schedules, even though irregularities in prices named by an Ironton producer should continue. In bars, structural shapes and plates there has been a fair amount of business placed in the last week. Quotations for the third quarter are steady at 1.90c., base Pittsburgh, for small miscellaneous lots, with large buyers obtaining material at 1.85c. Bookings of steel sheets by district mills have fallen off somewhat, partially on account of the lull incident to the Fourth of July holiday. Black sheets are selling at from 2.60c. to 2.65c., base Pittsburgh, while galvanized stock for roofing purposes continues at 3.40c., with a shading of $2 a ton still prevalent for delivery to Southern points. Blue annealed sheets range from 1.90c. to 2c., and automobile body sheets are firm at 4c. Operations of mills remain at about 90 per cent of capacity.

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and struc. shapes	3.40c.
Bars, soft steel or iron	3.30c.
New billet reinforc. bars	3.15c.
Rail steel reinforc. bars	3.00c.
Hoops	4.00c. to 4.25c.
Bands	3.95c.
Cold-fin. rounds and hex	3.85c.
Squares	4.35c.
Black sheets (No. 24)	3.90c.
Galvanized sheets (No. 24)	4.75c.
Blue ann'l'd sheets (No. 10)	3.45c.
Structural rivets	3.85c.
Small rivets	65 per cent off list
No. 9 ann'l'd wire, per 100 lb.	$3.00
Com. wire nails, base per keg	2.95
Cement c't'd nails, base 100 lb. keg	2.95
Chain, per 100	7.55
	Net per 100 Ft.
Lap-weld. steel boiler tubes, 2-in.	$18.00
4-in.	38.00
Seamless steel b'l'r tubes, 2-in.	19.00
4-in.	39.00

Reinforcing Bars.—Bids are being taken on approximately 1000 tons of bars for a municipal reservoir at Portsmouth, Ohio. Awards in the past week have been in fair volume, but, without exception, have called for less than 100 tons each. Prices are regarded as firm, with new billet bars quoted at 1.85c. to 1.90c., base Pittsburgh, and rail steel bars at 1.80c., base mill.

Warehouse Business.—Local jobbers have announced a reduction of $3 a ton on steel sheets, effective July 3. The new schedule is 3.90c. for No. 24 gage black, 4.75c. for No. 24 gage galvanized and 3.45c. for No. 10 gage blue annealed. Recent declines in mill prices of sheets are responsible for the downward revision of quotations.

Coke.—Foundries in this district are specifying fairly well against current contracts for by-product foundry coke, although shipments this month are expected to be slightly less than those in June. Demand for domestic grades has fallen off.

Foundry coke prices per net ton deliv'd Cincinnati: By-prod. coke, $9.02; Wise County coke, $7.09 to $7.59; New River coke, $9.09 to $9.59. Freight rates, $2.14 from Ashland, Ky.; $2.59 from Wise County and New River ovens.

Old Material.—The scrap market remains fairly firm, especially in view of the lack of interest shown by buyers. Steel plants are accepting normal shipments on current contracts, although the temporary shutdown of an important district mill has halted forward buying by that company. Railroad lists on which bids are being taken include the Southern, 7000 tons; Pennsylvania, 50,000 tons; and Norfolk & Western, 6800 tons.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel	$10.75 to $11.25
Scrap rails for melting	10.75 to 11.25
Loose sheet clippings	8.25 to 8.75
Bundled sheets	9.25 to 9.75
Cast iron borings	7.50 to 8.00
Machine shop turnings	7.00 to 7.50
No. 1 busheling	10.00 to 10.50
No. 2 busheling	6.00 to 6.50
Rails for rolling	12.50 to 13.00
No. 1 locomotive tires	12.75 to 13.25
No. 1 railroad wrought	10.00 to 10.50
Short rails	15.75 to 16.25
Cast iron carwheels	11.50 to 12.00
No. 1 machinery cast	15.25 to 15.75
No. 1 railroad cast	12.75 to 13.25
Burnt cast	7.50 to 8.00
Stove plate	8.25 to 8.75
Brake shoes	9.50 to 10.25
Railroad malleable	11.50 to 12.00
Agricultural malleable	11.00 to 11.50

St. Louis

Foundry Coke Reduced—Pig Iron Market Quiet—Good Orders for Sheets and Tin Plate

ST. LOUIS, July 10.—The beginning of the third quarter found the pig iron market quiet. Most melters in the district have bought only sparingly, and there is much iron to be bought for the next three months. Sales of the St. Louis Gas & Coke Corporation for the last week totaled 3300 tons, the largest order of which was 750 tons to an Illinois equipment manufacturer. Another Illinois melter took 600 tons, a local job foundry bought 500 tons; a local stove foundry took 600 tons, and 250 tons went to a Kansas City melter. The Independence Day holiday was, of course, a check to business. June shipments of the Granite City maker were about the same as in May.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$19.00
N'th'n No. 2 fdy., deliv'd St. Louis.	20.16
Southern No. 2 fdy., deliv'd.	19.92
Northern malleable, deliv'd.	20.16
Northern basic, deliv'd.	20.16

Freight rates: 81c. Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Coke.—The local by-product interest reduced its price on foundry coke $1 a ton to $8 f.o.b., ovens, for shipment out of town and 75c. a ton to $9, delivered St. Louis. There is very little buying of foundry or domestic grades.

Finished Iron and Steel.—Because of the holiday, mills did not operate last week, except the Granite City plate mill. The Granite City company is, however, receiving orders in sufficient volume for running all of its sheet and tin mills. Tin plate specifications are quite satisfactory and that department will continue to run virtually 100 per cent. Incoming business and backlog tonnage of plates warrants 100 per cent production and next week the company will operate the galvanizing department 75 to 80 per cent of capacity. New prices of plates, shapes and bars for third quarter have brought forth a satisfactory volume of business and second-quarter specifications against contracts have been gratifying to mills. The Texas & Pacific Railroad is in the market for 1000 kegs of track spikes for September and October delivery. The Terminal Railway Association bought 1200 kegs of track spikes.

Old Material.—The market for old material is very quiet. Consumers in the district have bought very little in several weeks, and given no indication that they will be in the market during July. Dealers have about covered on contracts, and they are merely marking time. No. 1 busheling, cast-iron borings, machine shop turnings, and No. 1 railroad wrought are 25c. lower. Railroad lists include: New York Central, 14,000 tons; Pennsylvania Lines, 49,885 tons; Baltimore & Ohio, 11,720 tons; Santa Fe lines, 6195 tons; Wabash, 2730 tons; Missouri-Kansas-Texas, 1300 tons; Frisco Lines, 1000 tons; Ann Arbor, 670 tons; Great Northern, 67 carloads.

Dealers' buying prices, per gross ton, f.o.b. St. Louis district:

Heavy melting steel	$10.75 to $11.25
No. 1 locomotive tires	12.00 to 12.50
Heavy shoveling steel	10.75 to 11.25
Miscell. stand.-sec. rails, includ'g frogs, sw'ches and guards, cut apart	12.25 to 12.75
Railroad springs	13.25 to 13.75
Bundled sheets	8.50 to 9.00
No. 2 railroad wrought	11.00 to 11.50
No. 1 busheling	9.25 to 9.75
Cast iron borings	8.50 to 9.00
Iron rails	13.00 to 13.50
Rails for rolling	13.00 to 13.50
Machine shop turnings	6.25 to 6.75
Steel car axles	17.25 to 17.75
Iron car axles	25.50 to 26.00
Wrot. iron bars and trans.	18.50 to 19.00
No. 1 railroad wrought	9.50 to 10.00
Steel rails, less than 3 ft.	15.00 to 15.50
Steel angle bars	11.50 to 12.00
Cast iron carwheels	13.00 to 13.50
No. 1 machinery cast	13.00 to 13.50
Railroad malleable	11.25 to 11.75
No. 1 railroad cast	13.00 to 13.50
Stove plate	11.00 to 11.50
Agricult. malleable	12.00 to 12.50
Relay. rails, 60 lb. and under	20.50 to 23.50
Relay. rails, 70 lb. and over	26.50 to 29.00

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struct. shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-fin. rounds, shafting, screw stock	3.75c.
Black sheets (No. 24)	4.45c.
Galv. sheets (No. 24)	5.25c.
Blue ann'l'd sheets (No. 10)	3.60c.
Black corrug. sheets (No. 24)	4.50c.
Galv. corrug. sheets	5.30c.
Structural rivets	3.75c.
Boiler rivets	3.75c.
	Per Cent Off List
Tank rivets, 7/8-in. and smaller, 100 lb. or more	70
Less than 100 lb.	65
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-press. nuts, sq., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50
Hot-press. nuts, hex., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50

Birmingham

Improved Inquiries for Pig Iron—Steel Sales Continue Steady—Cast Pipe Advanced

BIRMINGHAM, July 10.—Pig iron sales last week were somewhat lighter than for the previous week. Quiet negotiations have brought about a fairly steady volume of sales since the price reduction on June 20, and a considerable portion of third quarter iron is under contract. Present inquiries indicate improved sales for the next few days. Shipments improved slightly during the past week. For foreign ports, 840 net tons of basic iron was shipped by river during the latter part of the week. The Alabama City furnace of the Gulf States Steel Co. has been blown out for rebuilding along improved lines. The No. 2 furnace of the Republic Iron & Steel Co. was blown out on June 30 for relining. The new No. 5 Fairfield furnace of the Tennessee company, blown in on June 25, was changed from foundry to basic on June 28. Eighteen furnaces are now in blast. Of this number nine are on foundry, six on basic, one on recarburizing iron and one on ferromanganese.

Prices per gross ton f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil.	$15.50
No. 1 fdy., 2.25 to 2.75 sil.	16.00
Basic	$15.00 to 16.00

Cast Iron Pipe.—Some improvement was noted last week, though all new business is still confined to small orders, coming largely from private consumers. Several good tonnages are known to be in prospect and will probably be up for figures within 30 to 60 days. Effective the first of this week, another increase of $1 a ton was made. Quotations are now $34 to $35 on 6 in. and larger sizes. Shipments are active.

Coke.—Both sales and demand are unusually light. Second-half business is largely under contract and present activity is confined to a few spot sales in small lots. Specifications against contracts are improving. Prices are unchanged from the $5 base.

Old Material—The market is still in the dull period which has extended over the past several weeks. Only a few scattered sales are being made. A slightly better feeling is beginning to develop and dealers believe that the bottom has been reached. Prices have been the same for some time.

Prices per gross ton, deliv'd Birmingham dist. consumers' yards:

Heavy melting steel	$8.50 to $9.00
Scrap steel rails	11.00 to 11.50
Short shoveling turnings	7.50 to 8.00
Cast iron borings	8.00
Stove plate	13.50
Steel axles	19.00 to 20.00
Iron axles	20.00 to 21.00
No. 1 railroad wrought	10.00 to 10.50
Rails for rolling	13.00
No. 1 cast	14.25
Tramcar wheels	12.50 to 13.50
Cast iron carwheels	12.00 to 13.00
Cast iron borings, chem.	13.50 to 14.00

Finished Steel.—New business continues to develop at a fairly satisfactory and steady rate. Weekly sales are running close to the average of the past month. Demand for the more important lines appears well sustained and the outlook for the first part of the quarter is favorable. The sheet market is expected to show improvement following the reduction of $1 to $2 a ton made last week. Other prices remain the same. The Ingalls Iron Works has orders for 225 tons of structural steel for a fruit packing plant at Tampa, Fla., and 150 tons

for an airplane hangar at Miami. The Connors Steel Co. will furnish 300 tons of reinforcing steel for a power house at Mount Holly, N. C., for the Duke Power Co. The Tennessee company is operating seven open-hearth furnaces at Ensley and five at Fairfield. The Gulf States Steel Co. has reduced its operations at Alabama City from four to three.

Pacific Northwest

Large Building Prospects—Shading in Plate Prices—Nothing New in Steel Rate War

SEATTLE, July 7 (*By Air Mail*).—There have been no new developments lately in the threatened rate war between rail and water lines serving the Pacific Coast, due to the action of the Illinois Central and the Redwood Lines in putting in a rate of 61c. on articles of iron and steel from points in Illinois and Indiana to California. Other rail and water lines serving California points have not yet met this rate. Some conferences have been held between rail and water lines interested, but no definite action has resulted.

Local conditions in iron and steel are fairly active, but there is a tendency toward lower prices, plates having settled down to 2.25c., with reports that 2.20c. has been done. Jobbers say that June tonnage was only slightly under May, but the outlook is that July may show a larger drop.

New building conditions in Seattle are active, permits issued in June amounting to $6,223,355, the largest in any one month in the history of the city. For the first half of 1928, total permits issued amounted to $23,389,825, the largest in any half year period on record.

Pig Iron.—Sales are few and only for very small lots, prices being unchanged. We continue to quote No. 2 foundry and Utah basic at $25 to $26 gross tons, delivered Seattle.

Plates.—The only large work in sight is a new water line to serve the North End, which, if it goes through, will take several thousand tons of steel pipe. We quote tank plates at 2.25c., but one local interest, representing an Eastern mill, is naming 2.20c. on any desirable orders, c.i.f. Seattle.

Shapes.—New demand and inquiry is quieting down, and no large jobs are in sight. The Star Iron & Steel Co., Tacoma, has taken 400 tons for an addition to a salt and chemical plant at Tacoma. The Kettle Falls bridge at Kettle Falls, Wash., has been placed with an Eastern interest. Prices on shapes remain firm at 2.35c., c.i.f. Seattle.

Bars. — Demand for reinforcing steel is fairly active. The Northwest Rolling Mills, Inc., has taken 350 tons for the Benjamin Franklin apartments, while this company and the Pacific Coast Steel Co. have divided about 400 tons for a new warehouse for Frederick & Nelson. We quote reinforcing bars at 2.20c. in carload lots, and up to 3c. in small lots. Mild steel bars are firm at 2.35c., but demand is quiet.

Car Wheels.—The city of Seattle is to open bids on July 13 for 550 car wheels for the Seattle Municipal Street Railway.

Sheets.—Demand is quiet, and there is some unevenness in prices, some of the smaller Eastern mills apparently seeking orders. We quote galvanized sheets, No. 24 gage, at 4.15c. to 4.25c., No. 24 black at 3.25c. to 3.35c., and No. 10 blue annealed at 2.62c. to 2.72c., all c.i.f. Seattle.

Old Material.—There have been further sales of electric steel melting scrap at $13, delivered Seattle. Other grades are very quiet. We continue to quote electric steel melting scrap at $13 per gross ton, selected heavy melting steel scrap at $11 per gross ton, and No. 1 cast iron scrap at about $12 per net ton, all these prices being for Seattle delivery.

Warehouse Business.—Local jobbers report that June business was heavier than looked for, but it is expected that July will show some falling off. There have been no important changes in local jobbers' prices for some months.

Warehouse Prices, f.o.b. Seattle

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	3.00c.
Tees, bar sizes	3.50c.
Reinforcing bars	3.00c.
Blue annealed sheets (No. 10)	4.00c.
Black sheets (No. 24)	5.00c.
Galvanized sheets (No. 24)	5.75c.
Rivets, tank	55 & 5% off

Buffalo

Pig Iron Inquiry Improves but Buying Is Slow—Steel Buying Fairly Good After Holiday

BUFFALO, July 10.—There is a little more inquiry for pig iron this week, but buying is lagging. The Crane Co. is taking prices on 2000 tons of iron. Two other lots of 1000 to 2000 tons, which came out for bids last week, await placement. Small-lot business has been improving. Buffalo district prices are firm at $17 for No. 2 plain foundry and $17.50 for malleable, but these prices are shaded for delivery outside this immediate district.

Prices per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25	$17.00
No. 2X fdy., sil. 2.25 to 2.75	17.50
No. 1X fdy., sil. 2.75 to 3.25	18.50
Malleable, sil. up to 2.25	17.50
Basic	$16.50 to 17.00
Lake Superior charcoal	27.28

Finished Steel.—Steel buying was renewed promptly after July 4, in some lines especially. Sheets show a revival after a brief dull period. Black sheet orders have been taken at 2.70c. Reinforcing bar sales are large, with prospect of capacity mill operation this month. Wire deliveries are fairly good. There is some large structural business to be placed here soon, including 6000 tons for the new Rand Building. Warehouse sales the early part of this month were an improvement over those of early May and June. Bars are at 1.95c., Buffalo base, under competition with reinforcing bars and shapes similarly priced.

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and struct. shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.75c.
Cold-fin. flats, sq. and hex	4.45c.
Rounds	3.95c.
Cold-rolled strip steel	5.85c.
Black sheets (No. 24)	4.20c.
Galv. sheets (No. 24)	4.70c. to 5.05c.
Blue ann'l'd sheets (No. 10)	3.70c.
Com. wire nails, base per keg	$3.65
Black wire, base per 100 lb	3.90

Old Material.—Deliveries of heavy melting steel are being restricted closely here, with dealers cutting down their purchases to prevent yard accumulation. No. 1 heavy melting steel is nominally unchanged at $14 to $14.25, although some buyers have indicated willingness to make purchases at $13.50 for future delivery. Little scrap of any kind is moving. Buffalo dealers are not anxious to get railroad material offered this week, and little of this tonnage is expected to come here. The Bethlehem Steel Co. continues to receive scrap by water, but is not accepting deliveries from local dealers.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$14.00 to $14.25
No. 2 heavy melting steel	12.25 to 12.75
Scrap rails	13.50 to 14.00
Hydraulic comp. sheets	12.25 to 12.75
Hand bundled sheets	8.50 to 9.00
Drop forge flashings	12.00 to 12.50
No. 1 busheling	12.25 to 12.75
Hvy. steel axle turnings	12.00 to 12.50
Machine shop turnings	7.75 to 8.25
Acid Open-Hearth Grades	
R'lr'd knuckles and couplers	15.00
R'lr'd coil and leaf springs	15.00 to 16.00
Rolled steel wheels	15.00
Low phos. billet and bloom ends	16.00 to 16.50
Electric Furnace Grades	
Hvy. steel axle turnings	12.00 to 12.50
Short shov. steel turnings	10.00 to 10.50
Blast Furnace Grades	
Short shov. steel turnings	10.00 to 10.50
Short mixed borings and turnings	9.50 to 10.00
Cast iron borings	9.50 to 10.00
No. 2 busheling	9.00 to 9.25
Rolling Mill Grades	
Steel car axles	15.50 to 16.00
Iron axles	12.00 to 12.50
No. 1 railroad wrought	12.00 to 12.50
Cupola Grades	
No. 1 machinery cast	14.25 to 14.75
Stove plate	13.00 to 13.25
Locomotive grate bars	11.50 to 12.00
Steel rails, 3 ft. and under	16.50
Cast iron carwheels	12.00 to 12.50
Malleable Grades	
Industrial	15.00
Railroad	15.00
Agricultural	15.00

Canada

Large Structural Steel Inquiries—Lull Settles Over Pig Iron and Scrap Markets

TORONTO, ONT., July 9.—Interest in the Canadian pig iron market has slumped. The lull is attributed mainly to the beginning of the summer holiday season and the fact that July 2 was a general holiday in Canada. Advance buying of foundry and malleable iron has practically ceased, although a small number of melters are still expected to come forward with contracts to take care of needs up to the end of September. Current demand is for small tonnages for spot delivery, but even this business was off during the past few days. Local blast furnace representatives, however, believe that a strong spot demand will reappear shortly. Pig iron consumers are enjoying one of the best seasons since 1920, with present operations averaging about 75 per cent. Spot buyers are carrying limited stocks, and many will be forced into the market within the next couple of weeks to secure supplies for current needs. No change has been announced in pig iron prices either in the Toronto or Montreal markets.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	$23.10 to $23.60
No. 2 fdy., sil. 1.75 to 2.25	23.10 to 23.60
Malleable	23.10 to 23.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	24.50 to 25.00
No. 2 fdy., sil. 1.75 to 2.25	24.50 to 25.00
Malleable	24.50 to 25.00
Basic	23.50 to 24.00
Imported Iron, Montreal Warehouse	
Summerlee	33.50
Carron	33.00

Dealers' buying prices:

Structural Steel. — Demand for structural steel and reinforcing bars continues to improve. Each week brings forth a steady flow of new orders, but despite this there is little or no decline in the prospective business in sight. Approximately 8000 tons of structural steel will be required for a new customs house to be erected in Toronto by the Dominion Government, for which tenders are expected to be called about Aug. 1. Fully 3000 tons of structural steel will be required for a proposed new Federal Government building at Ottawa, Ont., for which plans are now being prepared by the architectural department of the Department of Public Works.

Old Material.—A state of stagnation settled on the market during the week and both Toronto and Montreal dealers reported very little business. Some inquiries are appearing, however, and selling interests look for an early revival of business. Prices are unchanged.

Per Gross Ton

	Toronto	Montreal
Heavy melting steel	$9.00	$7.00
Rails, scrap	10.00	9.00
No. 1 wrought	9.00	11.00
Machine shop turnings	7.00	5.00
Boiler plate	7.00	6.00
Heavy axle turnings	7.50	6.50
Cast borings	7.50	5.00
Steel turnings	7.00	5.50
Wrought pipe	5.00	5.00
Steel axles	14.00	20.00
Axles, wrought iron	16.00	22.00
No. 1 machinery cast	....	16.00
Stove plate	....	13.00
Standard carwheels	....	16.00
Malleable	....	13.00
Per Net Ton		
No. 1 machinery cast	15.00	....
Stove plate	9.00	....
Standard carwheels	13.00	....
Malleable scrap	13.00	....

San Francisco

Steel Demand Slightly Improved with Greatest Activity in Structural Shapes and Reinforcing Bars

SAN FRANCISCO, July 12.—Demand for steel products is slightly improved, with structural shapes and reinforcing steel bars the most active. Little or no change is noted in the price structure.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah fdy., sil. 2.75 to 3.25	25.00 to 26.00
**Indian fdy., sil. 2.75 to 3.25	24.00 to 25.00
**German fdy., sil. 2.75 to 3.25	24.25

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Awards include 275 tons shapes for A. M. Castle Co. warehouse, San Francisco, to Pacific Coast Engineering Co. and 175 tons for City Hall at Phoenix, Ariz., to Minneapolis Steel & Machinery Co. The Pacific Coast Steel Co. took 700 tons of reinforcing bars for the Lovejoy viaduct at Portland and 250 tons for the James Madison School at Seattle.

Burbank, Cal., placed 500 tons of cast iron pipe with the Grinnell Co., Pacific States Cast Iron Pipe Co. and American Cast Iron Pipe Co. Los Angeles opened bids on 2121 tons of 8 and 12-in. class 350 pipe.

Pending business includes 455 tons of shapes for a bridge at Saugus, Cal., 570 tons for the Bardsdale bridge at Ventura, Cal., and 600 tons for an apartment on Pacific Street, San Francisco. Los Angeles is calling for bids on 589 tons of reinforcing bars for Big Dalton Dam. Bids are being taken on 200 tons for a school in San Francisco.

Sales and inquiries for pig iron and coke are limited to small lots.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and struc. shapes	3.15c.
Soft steel bars	3.15c.
Small angles, ⅞-in. and over	3.15c.
Small angles, under ⅞-in.	3.55c.
Small channels and tees, ¾-in. to 2¾-in.	3.75c.
Spring steel, ¼-in. and thicker	5.00c.
Black sheets (No. 24)	4.95c.
Blue ann'l'd sheets (No. 10)	3.90c.
Galv. sheets (No. 24)	5.50c.
Struc. rivets, ½-in. and larger	5.65c.
Com. wire nails, base per keg	$3.40
Cement c't'd nails, 100-lb. keg	3.40

Detroit Scrap Prices Unchanged

DETROIT, July 10.—There have been no changes in prices on scrap in this district during the past week. Current orders are sufficient to cover the material being released.

Dealers' buying prices per gross ton f.o.b. cars, Detroit:

Hvy. melting and shov. steel	$11.00 to $11.50
Borings and short turnings	7.00 to 7.50
Long turnings	5.75 to 6.25
No. 1 machinery cast	14.00 to 15.00
Automobile cast	19.00 to 20.50
Hydraul. comp. sheets	9.75 to 10.25
Stove plate	11.00 to 12.00
No. 1 busheling	8.50 to 9.00
Sheet clippings	6.00 to 6.50
Flashings	9.00 to 9.50

Lebanon-Scranton Merger Virtually Assured

Announcement is expected soon of the merger of the Lebanon Iron Co., Lebanon, Pa., and the Scranton Bolt & Nut Co., Scranton, Pa., both makers of bar iron, bolts, nuts, spikes, etc. A new financial structure will be worked out and a public offering of securities will probably be made soon through Philadelphia bankers.

Charles Hart, president Delaware River Steel Co., Chester, Pa., who is representing the interests of the late William C. Sproul in the management of the Lebanon Iron Co., is active in the formation of the merger. The plan contemplates the use of the Lebanon plant for making bars and the concentration of bolt, nut and rivet manufacturing at Scranton.

Work on a $1,000,000 addition to the pressed steel division of the Motor Wheel Corporation, Lansing, Mich., will be begun at once and is expected to be completed Sept. 1. The new building will be 74 x 500 ft. and will parallel the present main building of the steel-working unit of the plant. The Motor Wheel Corporation, which now employs 2250 men in Lansing, reports sales for the first six months of 1928 to be 25 per cent greater than for the same period in 1927 and far greater than in any other six months' period in the history of the company.

Gisholt Machine Co., Madison, Wis., entertained the Chicago Superintendents' and Foremen's Club on Saturday, June 23. The Chicago group, numbering about 250, went to Madison on a special train and after an inspection of the Gisholt plant was taken on a bus tour through the city.

Non-Ferrous Metal Markets

All the Markets Quiet—Tin Sales Fairly Large—Prices Firm Except Lead, Which Is Lower

THE WEEK'S PRICES. CENTS PER POUND FOR EARLY DELIVERY

	July 10	July 9	July 7	July 6	July 5	July 3
Lake copper, New York	14.75	14.75	14.75	14.75	14.87½	14.87½
Electrolytic copper, N. Y.*	14.50	14.50	14.50	14.50	14.50	14.50
Straits tin, spot, N. Y.	46.25	46.25	....	46.12½	46.07½	46.12½
Lead, New York	6.20	6.20	6.30	6.30	6.30	6.30
Lead, St. Louis	6.10	6.10	6.15	6.15	6.15	6.15
Zinc, New York	6.55	6.55	6.55	6.55	6.55	6.55
Zinc, St. Louis	6.20	6.20	6.20	6.20	6.20	6.20

*Refinery quotation; delivered price ¼c. higher.

Copper. — Decided quietness pervades the entire market and sales to both foreign and domestic consumers have been of small proportions. Prices, however, continue exceedingly firm at 14.75c., delivered in the Connecticut Valley, for electrolytic copper and at 15c. c.i.f. European ports, for Copper Exporters, Inc. Such buying as there is is mostly for July, but it is admitted that both foreign and domestic consumers must still buy considerable metal for August delivery. Lake copper is quoted at 14.75c. to 14.87½c., delivered, in a quiet market.

Tin.—Considering the Fourth of July holiday, sales of 1000 tons for the week ended July 7 are considered fairly large. Yesterday, Monday, about 150 tons changed hands among dealers, but the interesting feature is that interest centers in August delivery and that futures are neglected. Previously demand has been for spot, July and August. This is pointed to as indicating that consumers have evidently let their supplies shrink. Otherwise the market has been exceedingly uninteresting. Today, Tuesday, spot Straits tin is quoted at 46.25c., New York, with demand very light. Quotations in London today were lower than a week ago, with spot standard quoted at £209 2s. 6d., future standard at £206 12s. 6d. and spot Straits at £212 2s. 6d. The Singapore price today is £209 5s. Arrivals thus far this month have been 2485 tons, with 5485 tons reported afloat.

Lead.—Owing to lower prices in London and the possibility of importations, the American Smelting & Refining Co., late yesterday, Monday, reduced its quotation from 6.30c. to 6.20c., New York, as the regular contract price. Values naturally sagged in the outside market and today the metal is quoted at 6.10c. to 6.12½c., St. Louis. A moderate business is reported, with activity a little more

Metals from New York Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	48.50c. to 49.50c.
Tin, bar	50.50c. to 51.50c.
Copper, Lake	15.75c.
Copper, electrolytic	15.50c.
Copper, castings	14.75c.
Zinc, slab	7.25c. to 7.75c.
Lead, American pig	7.25c. to 7.75c.
Lead, bar	9.25c. to 10.25c.
Antimony, Asiatic	12.00c. to 12.50c.
Aluminum No. 1 ingots for remelting (guar'nt'd over 99% pure)	25.00c. to 26.00c.
Alum. ingots, No. 12 alloy	24.00c. to 25.00c.
Babbitt metal, commerc'l grade,	30.00c. to 40.00c.
Solder, ½ and ½	31.50c. to 32.50c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	52.00c.
Tin, bar	56.00c.
Copper, Lake	14.85c.
Copper, electrolytic	14.85c.
Copper, casting	14.00c.
Zinc, slab	7.75c.
Lead, American pig	7.10c.
Antimony, Asiatic	16.00c.
Lead, bar	9.50c.
Babbitt metal, medium grade	18.50c.
Babbitt metal, high grade	55.50c.
Solder, ½ and ½	30.75c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass	19.25c.
Copper, hot rolled	24.00c.
Copper, cold rolled, 14 oz. and heavier	25.75c.
Seamless Tubes—	
Brass	24.12½c.
Copper	25.00c.
Brazed Brass Tubes	27.25c.
Brass Rods	17.00c.

From New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks	10.00c. to 10.50c.
Zinc sheets, open	11.00c. to 11.50c.

Non-Ferrous Rolled Products

Mill prices on bronze, brass and copper products are unchanged and zinc sheets and lead full sheets are still being quoted at the advances of June 7 and May 29 respectively.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	19.25c.
Copper, hot rolled	23.50c.
Zinc	9.25c.
Lead (full sheets)	10.00c. to 10.25c.
Seamless Tubes—	
High brass	24.12½c.
Copper	25.00c.
Rods—	
High brass	17.00c.
Naval brass	19.75c.
Wire—	
Copper	16.75c.
High brass	19.75c.
Copper in Rolls	22.50c.
Brazed Brass Tubing	27.25c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also to St. Louis on shipments to points west of river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	33.00c.
Tubes, base	42.00c.
Machine rods	34.00c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged customers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	12.625c.	14.00c.
Copper, hvy. and wire	12.50c.	13.50c.
Copper, light and bottoms	10.75c.	12.00c.
Brass, heavy	7.00c.	8.25c.
Brass, light	6.25c.	7.75c.
Hvy. machine composition	9.75c.	11.00c.
No. 1 yel. brass turnings	8.75c.	9.50c.
No. 1 red brass or compos. t'ngs	9.00c.	10.00c.
Lead, heavy	5.00c.	5.50c.
Lead, tea	4.00c.	4.50c.
Zinc	3.00c.	3.50c.
Sheet aluminum	12.75c.	14.50c.
Cast aluminum	12.50c.	14.00c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Consumers' Doors in City Limits)

Sheets—	Base per Lb.
High brass	19.25c.
Copper, hot rolled	23.50c.
Copper, cold rolled, 14 oz. and heavier	25.75c.
Zinc	10.00c.
Lead, wide	9.75c.
Seamless Tubes—	
Brass	25.62½c.
Copper	26.50c.
Brazed Brass Tubes	27.25c.
Brass Rods	17.00c.

pronounced in the West than in the East.

Zinc.—Consumer demand is reported to be fairly good each day and prices are exceedingly firm at 6.20c., East St. Louis, or 6.55c., New York, for prime Western zinc. A hand-to-mouth buying policy continues and producers are in no mood to force the market. Statistics for June showed a decrease in stocks of refined metal of about 750 tons, with production and shipments about balancing one another. Ore prices at Joplin are unchanged at $40 per ton and production is very light, only about 3500 tons, owing to the holiday, with sales between 9500 and 10,000 tons. The statistical position of the market is decidedly favorable.

Nickel.—Ingot nickel in wholesale lots is quoted unchanged at 35c., with shot nickel at 36c. and electrolytic nickel at 37c. per lb.

Antimony.—The market is a little firmer with Chinese metal for spot delivery unobtainable at less than 9.62½c., and with futures at 9.75c., New York, duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 23.90c. per lb., delivered.

Non-Ferrous Metals at Chicago

CHICAGO, July 10.—Sales are few in number and of moderate size. Copper and antimony are advanced and tin is lower in price. The old metal market is steady.

Prices, per lb., in carload lots: Lake copper, 14.87½c.; tin, 47.50c.; lead, 6.25c.; zinc, 6.30c.; in less-than-carload lots, antimony, 11.25c. On old metals we quote copper wire, crucible shapes and copper clips, 10.75c.; copper bottoms, 9.75c.; red brass, 9.50c.; yellow brass, 7.25c.; lead pipe, 4.75c.; zinc, 3.50c.; pewter, No. 1, 30c.; tin foil, 36.25c.; block tin, 45.25c.; aluminum, 12c.; all being dealers' prices for less-than-carload lots.

RAILROAD EQUIPMENT

THE Argentine State Railways have placed orders with United States makers for 1100 miscellaneous freight cars. Twenty electric locomotives have been placed by the Cleveland Union Terminals Co. Outstanding among the week's inquiries is one for 300 passenger train refrigerator cars from the Pennsylvania. Details of the week's business follow:

Chesapeake & Ohio will build 10 locomotive tenders in its own shops.

Chicago, West Pullman & Southern has ordered one six-wheel switching locomotive from Baldwin Locomotive Works.

Cleveland Union Terminals Co. has ordered 20 electric locomotives from General Electric Co.

Mexican Railway Co. has ordered two Pacific type locomotives from American Locomotive Co.

Missouri-Kansas-Texas has ordered 19 baggage and mail cars from American Car & Foundry Co.

Pennsylvania Railroad has revived its inquiry for 300 passenger train refrigerator cars.

Illinois Central is inquiring for 13 locomotive tenders.

Fruit Growers' Express has made inquiry for 150 steel underframes for refrigerator cars.

Jacob Dold Packing Co. is inquiring for 10 steel underframes for 30-ton refrigerator cars.

Argentine State Railways have placed orders for 1100 miscellaneous freight cars, the business having been divided between Middletown Car Co. and American Car & Foundry Co.

Alaska Railroad will buy one 2-8-2 type locomotive.

Delaware & Hudson will buy one 2-10-0 type high-pressure experimental engine.

Chicago, St. Paul, Minneapolis & Omaha

An item was published on page 1405 of THE IRON AGE for May 17 to the effect that the Spanish Government had ordered textile machinery older than 40 years to be destroyed and had provided for partial compensation for the destruction of machinery purchased during that time. A reply from Madrid is this: "Although project has been discussed as much as two years ago, government officials inform us no action has been taken and no indications of any early intention to carry out project."

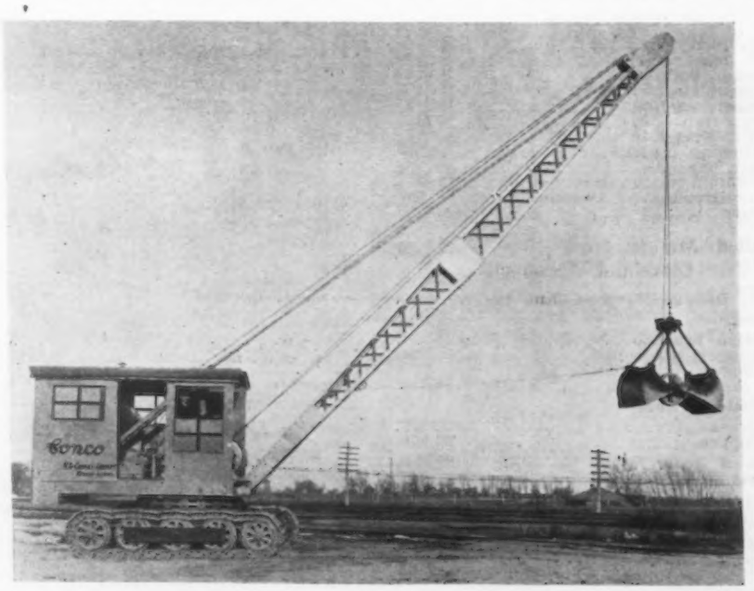
A company known as the Isothermos Corporation of America, 11 West Forty-second Street, New York, has been formed to manufacture, to American standards, the "Isothermos" journal box for use on railroad cars. This form of journal box is said to have become standard equipment on some European railroads and to be used also in Africa and in South America. Fitted with an automatic lubrication system, it is claimed that it will run for 100,000 miles without further attention or refilling.

Low-Built Crawler Crane for Rapid Handling of Bulk Materials

LOW center of gravity, speed, simplicity of operation, ruggedness and absence of friction clutches are features of a new crawler crane made by H. D. Conkey & Co., Mendota, Ill. The crane is designed for either gasoline or electric drive. It is self-contained, swings through the full circle and runs on an endless tread traction. It is primarily a rapid material-handling unit for grab bucket, dragline bucket and hook-block work.

One man operates all functions—hoisting, raising and lowering boom, swinging, traveling and steering—from the operator's deck near the front of the cab. The traveling gear is arranged for two speeds under control of the operator, regardless of the position of the turntable. The swing brake is of such design that the turntable or machinery deck may be set in any position with relation to the car body.

A special feature is the method of engaging the hoisting and holding drums. A heavy ball thrust bearing in connection with a special thrust nut provides an efficient means of operation and eliminates all thrust screws, washers, springs and cams. This feature brings about smoothness of operation with increased working capacity. The new crawlers are being built in ½, ¾ and 1-cu. yd. capacities.



Fabricated Structural Steel

Ohio River Bridge Takes 14,000 Tons of 42,600 Tons Awarded—Office Building Calls for 12,000 Tons

INCLUDING 14,000 tons for a bridge across the Ohio River at Louisville, Ky., fabricated structural bookings in the last week amounted to 42,600 tons. New projects totaled 20,900 tons, the largest being a building in New York, which will require 12,000 tons. Awards follow:

HARTFORD, VT., 200 tons, State bridge, to American Bridge Co.

FITCHBURG, MASS., 175 tons, theater, to New England Structural Co.

BOSTON & MAINE RAILROAD, 200 tons, bridge at Somerville, Mass., to American Bridge Co.

MECHANICVILLE, N. Y., 1200 tons, pulp and paper mill, to Palmer Steel Co.

NEW YORK, 3500 tons in the following jobs as reported to the Structural Steel Board of Trade: Apartment building at Riverside Drive and 104th Street and 110 West Eighty-sixth Street, Madison House at Madison and Jefferson Streets, court house at Amsterdam Avenue and 151st Street and public school 148, Jackson Heights, to Harris Structural Steel Co.

NEW YORK, 3500 tons, extension to Fourteenth Street office building, to McClintic-Marshall Co.

NEW YORK, 600 tons, stockyard building on West Forty-first Street for New York Central Railroad, to McClintic-Marshall Co.

STATE OF NEW JERSEY, 400 tons, highway bridge, to American Bridge Co.

LEHIGH VALLEY RAILROAD, 800 tons, bridge, to American Bridge Co.

DELAWARE, LACKAWANNA & WESTERN RAILROAD, 250 tons, bridge, to Phoenix Bridge Co.

PENNSYLVANIA RAILROAD, 600 tons, transmission towers, to Shoemaker Bridge Co.

PENNSYLVANIA RAILROAD, 250 tons, bridges, to Bethlehem Steel Co.

PHILADELPHIA, 1700 tons, garage, to McClintic-Marshall Co.

PHILADELPHIA, 2200 tons, garage and office building at 1608 Walnut Street, to McClintic-Marshall Co.

ATLANTIC CITY, N. J., 600 tons, power house for Haddon Hall-Chalfonte Hotel, to Bethlehem Steel Co.; to be electrically welded.

PLYMOUTH, PA., 1800 tons, coal breaker for Lehigh & Wilkes-Barre Coal Co., to Fort Pitt Bridge Co.

TAMPA, FLA., 225 tons, fruit packing plant, to Ingalls Iron Works Co.

ORLANDO, FLA., 150 tons, airplane hangar, to Ingalls Iron Works Co.

LOUISVILLE, KY., 14,000 tons, bridge over Ohio River between Louisville and Jeffersonville, Ind., to American Bridge Co.

NEWARK, OHIO, 180 tons, telephone building, to Pittsburgh-Des Moines Steel Co.

CLEVELAND, 500 tons, Randolph exchange building for Ohio Bell Telephone Co., to H. Brooks Co.

CINCINNATI, 130 tons, Christ Hospital, to McClintic-Marshall Co.

TOLEDO, 500 tons, plant for Libbey-Owens Glass Co., to Bellefontaine Bridge Works.

KENMORE, OHIO, 140 tons, Twenty-seventh Street viaduct, to Burger Iron Works.

MICHIGAN CENTRAL RAILROAD, 300 tons, bridge work, to McClintic-Marshall Co.

SAGINAW, MICH., 2600 tons, foundry for Chevrolet Motor Co., to American Bridge Co.

BUFFALO, 2500 tons, Rand Building; from John W. Cowper Co., contractor, to Bethlehem Steel Co.

CHICAGO, 750 tons, building for Miehle Printing Press Co., to Illinois Steel Co.

CHICAGO, 900 tons, building for International Harvester Co., to Gage Structural Steel Co., local.

CHICAGO, 345 tons, Kresge store building, to Wendnagel & Co., local.

CHICAGO, 250 tons, building for Produce Terminal & Cold Storage Co., to Gage Structural Steel Co.

CHICAGO, 165 tons, building for Commonwealth Edison Co., to Hansell-Elcock Co., local.

WILMETTE, ILL., 150 tons, water tank, to Chicago Bridge & Iron Co.

EAST ST. LOUIS, 935 tons, foundry, to McClintic-Marshall Co.

TACOMA, WASH., 400 tons, addition to salt and chemical plant, to Star Iron & Steel Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

SPRINGFIELD, MASS., 100 tons, city bridge.

NEW YORK, 12,000 tons, Western Union Building in West Broadway.

NEW YORK, 2000 tons, Sloan Memorial Y. M. C. A., Ninth Avenue and Thirty-fourth Street.

NEW CITY, N. Y., 300 tons, Rockland County Court House.

PHILADELPHIA, 600 tons, Girard Avenue Bridge.

PHILADELPHIA, 250 tons, morgue.

PHILADELPHIA, 875 tons, bridge for city of Philadelphia at Sixth Street and Allegheny Avenue; bids close July 11.

PENHURST, PA., 300 tons, normal school.

PENNSYLVANIA RAILROAD, 600 tons, electric transmission work; Shoemaker Bridge Co., low bidder.

READING RAILROAD, 300 tons, grade elimination work at Bridgeport, Pa.

TRENTON, N. J., 300 tons, State highway bridge; bids close July 23.

BURLINGTON COUNTY, N. J., 300 tons, Wading River bridge.

ATLANTA, GA., 800 tons, Mitchell Street viaduct.

SPRINGFIELD, ILL., tonnage not stated, highway bridges.

CHICAGO, 600 tons, two public schools.

CHICAGO, 150 tons, office building at Sixty-third Street and Maryland Avenue.

HIGHLAND PARK, ILL., 200 tons, elevated water tank.

MENASHA, WIS., 300 tons, Tayco Street bridge; general contract let to Greiling Engineering Co., Green Bay, Wis.

MILWAUKEE, 125 tons, municipal fire department repair shop; Milwaukee Structural Steel Co., low bidder.

OMAHA, NEB., 600 tons, Joslyn memorial building.

REINFORCING STEEL

AWARDS reported during the last week included no jobs of outstanding size and amounted only to 3000 tons. Among the new projects totaling 4750 tons are two warehouses in New York and Chicago, requiring 1200 tons each, and a municipal reservoir at Portsmouth, Ohio, which will take 1000 tons. Awards follow:

WHITE PLAINS, N. Y., 150 tons, garage, to Concrete Steel Co.

NEW YORK, 110 tons, loft building at John, Cliff and Pearl Streets, to Carroll-McCreary Co., Inc.

LONG ISLAND CITY, N. Y., 275 tons, post office, to Kalman Steel Co.

STATE OF NEW JERSEY, 100 tons, road work, to Concrete Steel Co.

MOUNT HOLLY, N. C., 300 tons, power plant for Duke Power Co., to Connors Steel Co., Birmingham.

CLEVELAND, TENN., 100 tons, school, to Connors Steel Co.

CHICAGO, 200 tons of rail and billet steel bars, apartment building at Fifty-first Street and Kenwood Avenue, to Concrete Engineering Co.

CHICAGO, 185 tons, Sayre Public School, to Concrete Steel Co.

CHICAGO, 285 tons, Chicago Women's Club, to Concrete Steel Co.; previously reported to unnamed bidder.

CHICAGO, 400 tons, Glen Holmes garage, to an unnamed bidder.

CHICAGO, 220 tons, Austin High School, to an unnamed bidder.

MAYWOOD, ILL., 210 tons, for Public Service Co. of Northern Illinois, to an unnamed bidder.

SEATTLE, 350 tons, Benjamin Franklin apartments, to Northwest Steel Rolling Mills.

SEATTLE, 400 tons, warehouse for Frederick & Nelson; divided between Northwest Steel Rolling Mills and Pacific Coast Steel Co.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

NEW YORK, 1200 tons, terminal warehouse for Lehigh Valley Railroad at 144th Street and Girard Avenue; Barney-Ahlers Construction Corporation, general contractor.

RAVENA, N. Y., 350 tons, work for city water department.

PORTSMOUTH, OHIO, 1000 tons, municipal reservoir.

CHICAGO, 1200 tons, building for Produce Terminal & Cold Storage Co.

CHICAGO, 500 tons, two public schools.

ST. LOUIS, 500 tons; hotel at Eighth and Market Streets, 300 tons; fruit house for Wabash Railway, 200 tons.

German Steam Boiler Business Poor

The business situation in the German steam boiler and apparatus industry, according to United States Trade Commissioner James E. Wallis, Jr., Berlin, was not generally prosperous during the first quarter of 1928. Boiler tube manufacturers report a decrease in orders both from at home and abroad, amounting to about 20 per cent, as compared with last year's average. The steam boiler apparatus makers appear to have been hit hardest, as the orders received during the first quarter of 1928 amount to only 50 per cent of those secured during the last quarter of 1927.

Exports of boiler apparatus have shown no improvement and there seems to be no indication of any immediate improvement as a whole.

PERSONAL

F. E. VIGOR has been appointed assistant works manager of the Ashland, Ky., division of the American Rolling Mill Co. For a number of years he has been assistant traffic manager, located at Middletown, Ohio.

F. E. VIGOR

D. S. MAIR, for 17 years manager of the Houston, Tex., office of Joseph T. Ryerson & Son, Inc., Chicago, has gone into business for himself under the name of the D. S. Mair Machinery Co., with offices at 505 Esperson Building, Houston. He will handle the complete line of bolt and pipe threading machines and Victor taps of the Landis Machine Co., Waynesboro, Pa., and the machine tool line of the Ryerson company.

—

EDWIN R. WEGENER has been appointed general manager of the Detroit Forging Co., Detroit, maker of drop forgings. For the last 16 years he has been identified with the steel and forging division of the Ford Motor Co.

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JULIUS F. STONE has been named president; Julius F. Stone, Jr., vice-president; J. C. Dunn, vice-president and treasurer, and Frederick Mitchell, secretary, of the Chisholm-Moore Hoist Corporation, Cleveland, which was formed recently following the purchase of the Chisholm-Moore Mfg. Co. by the Columbus McKinnon Chain Co., Tonawanda, N. Y. These men and A. L. McKinnon will constitute the new corporation's board of directors, and John R. Mears will continue as sales manager.

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FRANK C. NICHOLS, vice-president of the Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., has sailed for England on a business trip.

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CHARLES M. POND, manager of the small tool and gage department of the Pratt & Whitney Mfg. Co., Hartford, Conn., last week completed 25 years' service with the company.

—

H. W. FERNALD has severed his connection with the Boston office of Rogers, Brown & Crocker Brothers, Inc., and with Mrs. Fernald has started for the Pacific Coast for a 60-day trip. They will return via the Panama Canal. Donald R. Simonds has resigned as sales representative of the Eastern Malleable Iron Co., to succeed Mr. Fernald. Mr. Simonds formerly was associated with Read, Fears & Miller, Inc., and other Boston pig iron firms.

—

CARL F. WEIBLEN, formerly manager at Cleveland for the G. H. Williams Co., and previously a member of the home office organization at Erie, Pa., has been appointed Chicago manager. He replaces R. B. Randall, who is to be Pacific Coast manager for the Link-Belt Co., with headquarters at San Francisco.

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CARL R. ENGLISH, formerly storekeeper and purchasing agent for the Todd Dry Docks, Inc., Seattle, has been appointed purchasing agent for the Pacific Coast Cement Co., Pacific Coast Coal Co., Pacific Coast Engineering Co., and Pacific Coast Steamship Co., all affiliated interests, with headquarters at Seattle.

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JOHN C. WILLIAMS, vice-president and general manager Weirton Steel Co., Weirton, W. Va., accompanied by Mrs. Williams, will sail for Europe on the Berengaria, July 16.

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JOHN L. COLLINS, who has been in charge of the coal and coke division, Pittsburgh office, M. A. Hanna Co., has been transferred to the company's general offices in Cleveland. He has been succeeded at Pittsburgh by Charles R. Keenan.

—

F. W. SAMPSON has been appointed engineer in charge of the shock absorber division of the Continental Motors Corporation, Detroit. He has been a member of the company's engineering staff for four years.

—

A. W. LEWIS has been appointed acting resident manager in charge of the Clevelanad works and sales office of the United States Cast Iron Pipe & Foundry Co., Burlington, N. J.

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IRA J. OWEN has established himself as a consulting mechanical engineer, specializing in industrial surveys, to stress the engineering viewpoint in place of relying upon the balance sheet. He has offices at 400 First National Bank Building, Chicago. He is a graduate in mechanical engineering from Cornell University and is a member of the American Society of Mechanical Engineers and of the Western Society of Engineers.

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JOHN S. LATTA, for many years manager of the Philadelphia branch of the Manhattan Rubber Mfg. Co., Passaic, N. J., has resigned and has been succeeded by David Newhall. Headquarters remain at 2132 Market Street.

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MURRAY J. LAIRD has been made president of the Carpenter-Tew Gear Co., Inc., Brooklyn, succeeding W. H. Tew, who has resigned following a reorganization of the company. M. V. Tighe is now vice-president of the company, and J. L. Hannigan, secretary and treasurer.

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C. S. PROUDFOOT, general manager Vanadium Corporation of America, Niagara Falls, N. Y., whose election as president of the Association of Iron and Steel Electrical Engineers was announced in THE IRON AGE last week, was one of the pioneers in steel mill electrification 35 years ago. He was largely responsible for the blast furnace bell-operated rig which later helped him in a large degree to make possible the automatic blast furnace now in operation at the Bethlehem Steel Co. plant at Johnstown, Pa. He was associated with A. C. Dinkey at Homestead, in the early nineties and with A. A. Corey at Johnstown in 1918 as electrical engineer of the Bethlehem Steel Co., from which position he resigned to become general manager of the Vanadium corporation. Mr. Proudfoot has been an active member of the Association of Iron and Steel Electrical Engineers for the past 20 years.

C. S. PROUDFOOT

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W. ROACH, for the last 10 years identified with the American Brass Co., most recently as manager of the sales promotion department at its Buffalo branch, has been appointed assistant sales manager of the mill products division, Mueller Brass Co.,

Port Huron, Mich. Before going with the American company, he was employed in the manufacturing departments of Dodge Brothers, Inc., Detroit.

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JOHN S. SAMMONS, for the last two and a half years sales manager of the Beardsley & Piper Co., Chicago, has been appointed general manager of the American Foundry Equipment Co., Mishawaka, Ind. He was born at London, Ont., in 1890, and after attending grammar school at Rockford, Ill., began work with the Andrews Iron & Wire Works, Rockford. In recent years he has served several companies in sales and executive capacities.

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E. R. ANDERSON, formerly identified with the Chicago office of the Hendey Machine Co., Torrington, Conn., has joined the sales organization of the Stocker-Rumely-Wachs Co., Chicago, dealer in machine tools.

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F. H. LUCAS, formerly assistant manager in the Detroit office, American Bridge Co., has been appointed contracting engineer at Chicago for the McClintic-Marshall Co.

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E. J. PAULUS has been appointed manager of the Chicago district for the McClintic-Marshall Co. Mr. Paulus was engineer of construction for the company of the Detroit River bridge.

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E. N. MATTSON has been appointed sales manager in the Chicago office of the American Cast Iron Pipe Co., Birmingham, succeeding D. W. Wallace, who has taken charge of the Minneapolis office of that company.

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J. J. SEAVER, formerly vice-president of Arthur G. McKee & Co., Cleveland, has become associated with H. A. Brassert & Co., Chicago engineers, as vice-president.

The Interstate Commerce Commission has postponed from July 8 to July 14 the effective date of its decision in the Consolidated Southwestern cases. On June 21 the commission issued an order denying a petition of the Southwestern Pipe Consumers' Committee to reopen the case so far as it related to the new rates provided on wrought iron and steel pipe. The committee has again petitioned the commission, asking that it reconsider the order.

The Aluminum Co. of America, Pittsburgh, has commenced the manufacture of barium and zinc fluorides, which find an increasing use in the enamel, glass, tile and brick trades. Charles Hardy, Inc., of 100 East Forty-second Street, New York, has been appointed distributing agent in the United States for these products.

OBITUARY

CHARLES MACDONALD, one of the country's best known bridge engineers, president of the American Society of Civil Engineers 20 years ago, and the second president of the Engineers Club, New York, died July 8, near Gananoque, Ont., aged 91 years. In 1890 he helped organize the American Bridge Co., of which he was vice-president until it was absorbed by the United States Steel Corporation.

—

FREDERICK P. REINHART, treasurer Standard Screw Products Co., Detroit, died at the Ford Hospital in that city on June 29 after a brief illness. He was born in Pittsburgh 45 years ago. Before going with the Standard company 14 years ago he was associated for a time with the Hamilton Iron & Steel Works, Hamilton, Ont.

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HERBERT LLOYD, chairman Electric Storage Battery Co., Philadelphia, died in that city on July 3, aged 66 years. Prior to his partial retirement on account of ill health last year, he had been president of the Storage Battery company for 20 years. Mr. Lloyd was born in Wales and came to this country in early life to take up post-graduate work in chemistry.

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GERARD T. VAN SCHAICK, president of the Universal Railway Supply Co., Chicago, was killed, July 8, in an automobile accident near his summer home on Eagle River, Wis.

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SAMUEL L. AYR, automotive engineer, died at his home in Detroit on July 4. He was born in Scotland 49 years ago and was graduated from the Glasgow Technical College as a mechanical engineer. When he was about 25 years old Mr. Ayr came to America and settled in Detroit, where he entered the employ of the Packard Motor Car Co. Leaving the Packard organization he went with the Automatic Transportation Co., Buffalo, and later had been an engineer on the Detroit staff of General Motors Corporation.

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E. J. REMENSNYDER, who has been assistant purchasing agent of the Pennsylvania Railroad for many years, died at the Oliver Baird Hospital, Philadelphia, June 28, aged 44 years.

Standard Pound One Century Old

By act of Congress May 19, 1828, the Troy pound was adopted as standard by the United States Mint. To quote from the act: "The brass pound weight, procured by the Ministry of the United States at London in 1827, for the use of the Mint, and now in the custody of the Mint in Philadelphia, shall be the standard Troy pound of the Mint of the United States, conformably to which the coinage thereof shall be regulated."

Although that Troy pound was officially made the standard for coinage only, it became in effect the primary standard of the United States for all purposes, according to a statement in the Monthly News Bulletin of the Department of Commerce. The avoirdupois pound was derived from it through the relation of 7000 grains making a pound avoirdupois, against 5760 of the same size grains making a Troy pound. In 1911 the Troy pound of the Mint was superseded by the Troy pound of the Bureau of Standards, but this involved no change in value.

Bituminous coal raised in the first half of the year is reported by the United States Bureau of Mines at 234,280,000 net tons. This compares with 276,410,000 tons in the first half of 1927 and, with the exception of 1925, was the lowest total in the first half of any year since 1922.

Government Steel Industry in South Africa

The South African Iron & Steel Industrial Corporation, Ltd., was created by an act recently passed by the Parliament of the Union of South Africa. The authorized capital stock is £3,500,000, of which 500,000 "A" shares of £1 each will be subscribed by the Governor-General and 3,000,000 "B" shares of £1 are to be offered for subscription by the public. The A shares are to be paid for from funds to be appropriated by Parliament. The board of directors will consist of seven members, of which four will be appointed by the Governor-General and three by private shareholders. The Governor-General will designate the chairman of the board and the managing director.

The act also provides that the Railways and Harbours Administration shall contract with the new corporation for iron and steel that it may require.

Production of electric power by public utility power plants in the United States in May is reported by the Geological Survey at 7121 millions of kwhr. This compares with 6853 in April and with 7246 in March. The May total produced by water-power was considerably larger than in April or March, having aggregated nearly 45 per cent of the total output, against 39 per cent in March and 43 per cent in April.

Dullness Features European Markets

French Costs Rise with Franc Stabilization—Belgian Back-Logs Shrink—Russian Output Higher

(*By Cable*)

LONDON, ENGLAND, July 9.

PIG iron continues dull and output further has been restricted by damping one Midland furnace. Cleveland makers are seeking fresh orders, but consumers are not contracting for forward needs at present prices. Hematite iron is weak on continued absence of demand and heavy stocks despite limited output.

Foreign ore is quiet. Some non-union Swedish miners returned, but there are few signs of any definite end to the strike.

Finished steel is dull in the heavy lines, but moderately active in some other departments, particularly bolts, nuts and rivets.

Export demand for heavy material is virtually idle, Scottish works closing for the Glasgow Fair at the end of the current week. Robert Hyde of Sheffield is moving works to Stoke, as being more convenient.

Continental iron and steel also is quiet, but the price position is unaffected by Antwerp dock strike, which, it was hoped, would terminate this week.

Tin plates are quiet on the recent fall in tin. Consumers are withholding, but makers are well sold. Forward business is done at 18s. 3d. and prompt at 18s. 6d., both on the basis of IC plates, base box, f.o.b. works port.

Galvanized sheets are moderately active in small parcels. Black sheets are quiet.

Costs Up with Stable Franc

More Accurate Cost Figuring Expected—New Taxes Have Awaited Stabilization

PARIS, FRANCE, June 26.—Stabilization of the franc on the basis of one-fifth of its pre-war value has brought up the question of its influence on prices. It is expected that costs will increase to some extent, as, with the franc on a gold basis, French producers will more accurately determine depreciation, in proportion to the new valuation of their plants. There will also be the additional cost of new social legislation, such as the insurance act, which had been postponed until stabilization of the currency was completed.

The valuation of the franc, as stabilized, is at practically the same level as during the past 12 to 18 months. It will, however, permit greater security in transactions and should tend to reduce the rate of interest.

Pig Iron.—A total of 35,000 tons of phosphoric foundry iron has been placed at the disposal of domestic foundries for July, 3000 tons less than in June. The supply of hematite iron for domestic users in July has been reduced to 35,000 tons, a decline of 5000 tons from the June figure. To offset the reports that stabilization of the franc would result in higher pig iron prices, it has been announced that the price of foundry iron will be maintained unchanged for three months, until the end of September. Should this method of establishing a price for three-month periods prove satisfactory, it may be continued in the future. The present quotation is 440 fr. ($17.25) per ton, f.o.b. Longwy, for No. 3 foundry grade. The entente of French, Belgian and Luxemburg producers of pig iron has decided to place 30,000 tons of phosphoric iron at the disposal of Belgium during August and September, and the association will maintain its export prices, except on shipments to Italy, which will carry an increase of 1s. (24c.) per ton.

Semi-Finished Material.—An advance in semi-finished material and beams of 20 to 25 fr. (78c. to 97c.) per ton is contemplated, but the Comptoir Siderurgique has announced that no change in prices will be made for the next month. In the domestic

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.87 per £ as follows:

Durham coke, del'd	£0	17½s.	to £0	18s.	$4.27	to	$4.38
Bilbao Rubio ore*	1	2½			5.48		
Cleveland No. 1 fdy	3	8½	to 3	9½	16.68	to	16.92
Cleveland No. 3 fdy	3	6			16.07		
Cleveland No. 4 fdy	3	5			15.83		
Cleveland No. 4 forge	3	4½			15.71		
Cleveland basic (nom.)	3	5			15.83		
East Coast mixed	3	8	to 3	9	16.56	to	16.80
East Coast hematite	3	10½			17.17		
Rails, 60 lb. and up	7	15	to 8	5	37.75	to	40.18
Billets	6	5	to 6	15	30.44	to	32.88
Ferromanganese	13	15			66.97		
Ferromanganese (export)	13	0	to 13	5	63.31	to	64.53
Sheet and tin plate bars, Welsh	6	0			29.22		
Tin plate, base box	0	18¼	to 0	18½	4.44	to	4.50
Black sheets, Japanese specifications	13	7½			65.14		
					C. per Lb.		
Ship plates	7	12½	to 8	2½	1.66	to	1.77
Boiler plates	9	0	to 10	10	1.95	to	2.28
Tees	8	2½	to 8	12½	1.77	to	1.99
Channels	7	7½	to 7	17½	1.60	to	1.71
Beams	7	2½	to 7	12½	1.55	to	1.66
Round bars, ¾ to 3 in.	7	5	to 7	15	1.58	to	1.69
Steel hoops	9	0	to 10	0	1.95	to	2.17
Black sheets, 24 gage	9	15	to 10	0	2.12	to	2.17
Gal. sheets, 24 gage	13	10			2.93		
Cold rolled steel strip, 20 gage, nom.	16	0			3.48		

*Ex-ship, Tees, nominal.

Continental Prices, All F.O.B. Channel Ports

(Per Metric Ton)

Foundry pig iron (a):							
Belgium	£3	3s.	to £3	5s.	$15.34	to	$15.83
France	3	3	to 3	5	15.34	to	15.83
Luxemburg	3	3	to 3	5	15.34	to	15.83
Basic pig iron (nom.):							
Belgium	3	1	to 3	2	14.85	to	15.09
France	3	1	to 3	2	14.85	to	15.09
Luxemburg	3	1	to 3	2	14.85	to	15.09
Coke	0	18			4.39		
Billets:							
Belgium	4	15			23.14		
France	4	15			23.14		
Merchant bars:					C. per Lb.		
Belgium	5	13½	to 5	14	1.23	to	1.26
France	5	13½	to 5	14	1.23	to	1.26
Luxemburg	5	13½	to 5	14	1.23	to	1.26
Joists (beams):							
Belgium	4	17½	to 4	18	1.06	to	1.07
France	4	17½	to 4	18	1.06	to	1.07
Luxemburg	4	17½	to 4	18	1.06	to	1.07
Angles:							
Belgium	5	10	to 5	12½	1.21	to	1.23
⅛-in. plate:							
Belgium (a)	6	11			1.44		
Germany (a)	6	11			1.44		
⅜-in. ship plate:							
Belgium	6	7			1.40		
Luxemburg	6	7			1.40		
Sheets, heavy:							
Belgium	6	1			1.34		
Germany	6	1			1.34		

(a) Nominal.

market blooms are quoted at 535 fr. ($20.97) per ton, billets at 565 fr. ($22.15) per ton and sheet bars at 600 fr. ($23.52) per ton, all f.o.b. Thionville.

Finished Material.—Mills are still well booked with orders and in most cases are asking three to four months to make deliveries. Business from foreign markets and the French colonies is in good volume, and mills are expecting some sizable orders for Navy construction work and from the railroads. For export, steel bars have receded from the maximum of £5 15s. to £5 16s. per ton (1.27c. to 1.28c. per lb.), the market a fortnight ago, to about £5 13s. 6d. per ton (1.25c. per lb.). Competition for hoop orders is keen, with quotations slightly higher than on other products. Sheet prices in the export market have begun to sag, but there is still a fair domestic demand. Deliveries range from two to three months. Prices of wire rods in the domestic market are to be advanced, Aug. 1, 25 fr. (97c.) per ton for both basic, Bessemer and open-hearth grades, the new quotations being 825 fr. ($32.34) per ton for basic and 945 fr. ($37.04) for open-hearth rods.

Belgian Market Weaker

Pressure by Exporters Has Brought Price Decline—Deliveries Shorten

ANTWERP, BELGIUM, June 22.—Following a period of decided firmness, the steel market has begun to show weakness. Mills are apparently well booked, but buyers are beginning to doubt that unfilled tonnages of most makers are as large as was previously believed. As a result, consumers are pressing for concessions and the market has a downward trend. Exporters have contributed to weakness of prices by accepting foreign business below mill prices and then offering firm orders at lower figures. Price instability has extended to domestic business. However, foreign trade continues fair and is improving, especially with southern China. At the same time, German mills are showing less interest in export business and some are practically out of the market.

A strike of dock workers at Antwerp has been an obstacle to the normal flow of export shipments, and sellers are having considerable difficulty in making deliveries, which are long overdue.

Pig Iron.—Domestic demand continues fair and there is a small volume of export business. No. 3 phosphoric foundry iron is quoted at about 580 fr. ($16.40) per metric ton to domestic users and continues at about £3 2s. 6d. ($15.40) per ton, f.o.b. Antwerp, for export. French competition in Thomas grade iron is keen, and prices are slightly weaker. Bessemer hematite iron is still in competition with the British product, and the market is about $18.45 per ton, f.o.b. furnace.

Semi-Finished Material. — Blooms are still moderately firm and available supplies are small, but mills are seeking orders for billets and the market on sheet bars is depressed, with prices weak. Blooms range from £4 6s. ($21.10) per ton for 8-in. to £4 12s. ($22.55) for 4-in. Billets are quoted at £4 13s. ($22.80) per ton for 3-in. and £4 15s. ($23.30) for 2-in. Sheet bars are about £4 16s. ($23.50) per ton, f.o.b. Antwerp.

Finished Material.—Buyers are beginning to doubt that mills have been as well booked as previously reported, and pressure for concessions has been partially successful. Much earlier deliveries are being offered by makers than could be obtained a fortnight or more ago. Steel bars are offered quite freely at £5 14s. to £5 15s. per ton (1.26c. to 1.27c. per lb.), and as low as £5 13s. 6d. per ton (1.25c. per lb.) is obtainable on a desirable bar specification. Other steel products show the same tendency toward weakness, except wire rods, the price of which is unchanged. Beams are quoted at £4 18s. per ton (1.08c. per lb.), and corrugated bars at £5 17s. per ton (1.29c. per lb.). Hot-rolled steel hoops are £6 15s. per ton (1.49c. per lb.), all f.o.b. Antwerp. Sheet prices show slightly less weakness than other products, and French competition is still evident, but not as a serious factor.

Decline in French Exports, Increase in Imports

Exports of iron and steel products from France during the first quarter of 1928 totaled 1,441,477 metric tons, against 1,494,596 tons during the corresponding period of last year, while imports were 44,624 tons and 34,448 tons respectively, according to report received by the Department of Commerce from the assistant commercial attaché at Paris. In exports, pig iron showed a 20 per cent decline in the first quarter of this year, to 164,545 tons from 217,562 tons during the corresponding period of last year; blooms, billets and bars decreased 5 per cent, to 726,153 tons from 762,036 tons; structural material declined 30 per cent, to 48,659 tons from 65,517 tons; rails declined 7 per cent, to 85,248 tons from 91,161 tons. Cut sheets increased almost 85 per cent, to 32,806 tons from 17,997 tons; hot-rolled hoop iron and steel increased 45 per cent, to 35,600 tons from 22,849 tons, and machine iron or steel increased 30 per cent, 60,515 tons from 46,982 tons. Iron ore exports increased 20 per cent, to 4,159,822 tons from 3,403,028 tons. The greatest increase in imports during the first quarter of 1928 over the corresponding period of 1927 was made in pig iron, the totals being 12,140 tons and 5419 tons respectively.

Although the total iron and steel exports during the first quarter of 1928 were slightly less than in the corresponding period of the previous year, at the beginning of 1927 there was a heavy carry-over of orders accumulated in the fall of 1926 as a result of the British coal strike, which diverted many orders to the Continent. The fact that the sales abroad in the early part of 1928 nearly approximated the abnormal conditions in the first part of 1927 is taken to indicate that the French iron and steel industry is finding demand heavier, both at home and abroad.

Germany to Produce Aluminum Sheets Next Year

HAMBURG, GERMANY, June 23.—According to latest reports, the sheet mill being constructed by the Stahlwerke Hoesch of Dortmund at Stockheide will be ready for operation about January, 1929. The new mills will produce aluminum-plated sheets under the "Feran" process, which will be offered in competition with tin plate. Thus far the Hoesch interests have refused to give licenses for the use of the process in foreign countries.

Japan Places Cable Order in Germany

HAMBURG, GERMANY, June 23.—An order for 90 miles of deep sea cable has been booked by the German cable manufacturers, Felten & Guilleaume of Cologne, from the Japanese Government. Other recent orders booked by these makers have included a cable from Denmark to Sweden, one from Sweden to Germany and a large order from Italy for a Mediterranean cable.

Brazilian Imports Increase Heavily in 1927

WASHINGTON, July 10.—Imports of iron and steel products into the Brazilian port of Santos in 1927 aggregated 206,805 metric tons as against 155,103 tons in 1926, a gain of 51,702 tons, according to the Department of Commerce. The principal suppliers of this trade were Belgium, with 42 per cent of the 1927 total, compared with 43.5 per cent of the 1926 imports; the United States, with 24.3 per cent against 22.9 per cent; Great Britain, with 17.9 per cent compared with 8.9 per cent; and Germany, with 4.6 per cent against 7.1 per cent. Countries not listed supplied 10.6 per cent of the 1927 total, against 17.6 per cent of the 1926 total.

Seven classes of commodities combined in 1927 to constitute nearly 75 per cent of the total imported, rails and accessories leading with 46,956

tons, against 51,602 tons in 1926. Other leading items of importation in 1927 were black sheets and plates, 29,192 tons; cast iron pipe, 22,996 tons; bars and bar mill shapes, 22,221 tons; barbed wire and staples, 15,279 tons; steel tubes, 12,465 tons, and galvanized and other wire, 10,049 tons.

The United States supplied 51.4 per cent of the total imports of rails and accessories, Great Britain supplied 74 per cent of the imports of black sheets and plates. Belgium was credited with 82 per cent of the imports of cast iron pipe, 72 per cent of the bars and bar mill shapes, and nearly 52 per cent of the imports of barbed wire; the United States supplied 29.3 per cent and Germany 10.7 per cent of the last-named product.

Sources of Imports of Iron and Steel Products Through Santos, Brazil, in 1926 and 1927

Country	1926 Metric Tons	1927 Metric Tons
Belgium	67,600	88,237
Germany	10,926	9,515
Great Britain	13,715	36,937
United States	35,533	50,184
All other countries	27,329	21,932
Total	155,103	206,805

Russian Steel Output Expands

Large Part of Proposed Expenditures on Industry Are in Steel Plants—Volga Bridge Planned

MOSCOW, RUSSIA, June 22.—Although the program for iron and steel production in the fiscal year 1927 to 1928 was not in all cases fulfilled, Russia's output in the first half of the year was considerably larger than in the corresponding period of the fiscal year 1926 to 1927. From last Oct. 1 to March 31 of this year pig iron output totaled 1,851,100 metric tons, compared with 1,473,450 tons in the first half of the previous business year. Steel ingot production was 2,406,200 metric tons, compared with 1,766,500 tons in the same period of the previous business year, and output of rolled products was 1,908,700 metric tons, compared with 1,343,550 tons.

The program of the Soviet Government for the business year beginning in October, 1928, and ending in October, 1929, calls for a total capital investment in metallurgical development of 490,000,000 rubles, out of a total of 1,752,000,000 rubles to be expended in all industry. The Council of Economy complains of high prices for steel and, particularly, of increased costs of railroad rolling stock. Actually, metal prices are only 71 per cent higher than before the war, according to the official price index, while the general index is 188. Steel prices are relatively dear, however, in view of the fact that German steel prices are only about 27 per cent higher than the pre-war level.

Construction work in prospect includes shortening and straightening a new central Asian railroad, which joins the Siberian with the old central Asian railroad. It has also been decided to build a new railroad bridge across the Volga River at Kostroma at a cost, including approaches, of about 8,000,000 rubles ($4,000,000).

Coal production in the business half-year just completed showed a decline, according to Government reports, but continued about 15 per cent greater than in the corresponding previous half-year. The coal program for the current business year, 1927 to 1928, has been set at 37,000,000 metric tons, in keeping with a plan to gradually increase output to about 69,000,000 tons in 1932 to 1933. It is planned to sink 24 new mines, and existing mines are to be almost entirely electrified and equipped with modern machinery. The proposed total investment in the next five years is placed at 900,000,000 rubles, of which 210,000,000 rubles is for construction of miners' dwellings.

Export Trade in Fair Volume

Tin Plate and Rails Bought by Japan—Steel Importers Here Protest New Shape Duty

NEW YORK, July 10.—Export business is confined mainly to orders for small lots of material. Demand for barbed wire from South America continues good, and a fair tonnage of tin plate seconds is moving to Japanese and Chinese consumers. The Kioto Oil Co. in Japan, which inquired recently for about 12,000 base boxes of oil can tin plate and was reported to have closed on 3000 boxes a week ago, has also placed 4000 boxes of primes with a large Japanese export house and 1500 boxes of primes and 4000 boxes of seconds with another Japanese exporter, bringing the total purchase of primes and seconds to 12,500 base boxes.

There is very little business in the market for light-gage black sheets, except for occasional purchases by Japanese consumers willing to pay a premium for the American product. A large Japanese galvanizing plant, which produces a special brand of light-gage galvanized sheet, has placed its usual requirements of 5000 tons of black sheets, of which 3000 tons went to an American maker and 2000 tons to British and Continental mills. Export prices on light-gage black sheets continue at about $76 per ton for American sheets and $73.50 per ton for the British product.

The only rail business that has been in the market from the Far East is about 9 miles of 91-lb. and 100-lb. sections for Tokio municipality, which has been awarded to a large American maker by one of the leading Japanese exporters.

Importers Want New Duty Postponed

A brief filed with the United States Treasury Department by importers of steel who are affected by the ruling that bar mill sizes of channels, angles and tees are dutiable as bars points out that they were not given an opportunity to present their case prior to the decision and, with only 30 days from the time of publication allowed before the new duty goes into effect, they are likely to suffer considerable loss on business taken on the basis of the former rate. The brief filed by the importers points out that the paragraph on structural shapes adequately covers the bar mill sizes of 3 in. and smaller. The further claim is made that larger than 3-in. shapes can be rolled on a bar mill and one domestic mill produces such shapes.

Time Extension Requested

In addition to the protest against any change in the classification of this material, the importers request an extension of four months in the time allowed before the application of the new duty, to permit the clearance of orders to which they were previously committed. The present strike of dock workers in Antwerp is given as one reason for a delay, as it is claimed that many shipments which would have normally been delivered by this time have been delayed by the strike.

Application of the bar classification to bar mill sizes of channels, angles and tees will particularly affect importers with orders for furring channels. Under the structural paragraph of the tariff the duty amounts to 20c. per 100 lb. regardless of cost, but under the bar paragraph the duty is 30c. per 100 lb. on material costing less than 1.50c. per lb. at the mill and 50c. per 100 lb. on material costing more than 1.50c. at the mill. Furring channels cost about $36 per ton, f.o.b. mill, or about 1.60c. per lb., and would be subject to the duty of 50c. per 100 lb.

Germans Offer Corrugated Sheets for Export

HAMBURG, GERMANY, June 23.—Mills are renewing their efforts to establish an export trade in corrugated galvanized sheets, and a few orders have been booked for shipment to consumers in Mediterranean and northern European countries, to which water freight rates are in many cases cheaper than from British ports. This helps to offset the lower price of British sellers. The minimum quotation by German makers is about £13 12s. 6d. ($66.36) per ton, f.o.b. port.

Machinery Markets and News of the Works

Implement Makers Continue Buying

Wright Aeronautical and General Electric Purchases Also Contribute to Fair Rate of Activity—Louisville & Nashville Railroad Preparing Sizable List

PURCHASES by farm implement makers and builders of tractors, and also by the Wright Aeronautical Corporation and the General Electric Co., were outstanding in the machine tool business the first ten days of July. Continued buying by the implement and tractor industries is expected, programs of machine tool needs for production schedules for the opening of 1929 being in progress.

Bookings in almost all territories have held up fairly well, with something of a spurt in the Cleveland district.

The combined purchases of the Wright and General Electric companies will total large. The Wright company, in preparing to occupy an addition to its plant, is planning for a production of 250 airplane engines per month, which is more than double its present output. Production of 500 engines a month is the plan in connection with the completion of a second addition to the plant. Purchases by the General Electric Co. are for its refrigerating machinery department and a number of machine tools have already been bought.

Buying by the automotive industry has been light, although there has been some demand from makers of parts in the Cleveland and Detroit districts.

Railroad inquiry includes a few machines for the Rock Island and the Chicago & North Western. The Louisville & Nashville is said to be preparing a sizable list for shops at Mobile, Ala. The Illinois Central is asking for prices on the rebuilding of a number of old lathes. The Boston & Albany has closed on most of its list of 25 or more tools.

The Timken Roller Bearing Co., Canton, Ohio, has issued a small list of machine tools for use in its maintenance department.

Some of the fair sized sales of the week were: 15 engine lathes to a Middle West manufacturer, 10 presses and drilling machines to the National Acme Co., Cleveland, 10 automatic screw machines to the Gairing Tool Co., Detroit, and seven turret lathes to the Fulton Syphon Co., Knoxville, Tenn.

New York

NEW YORK, July 10.

LARGE purchases by the General Electric Co., Schenectady, and the Wright Aeronautical Corporation, Paterson, N. J., featured machine tool business of the first 10 days of July. Otherwise the market was rather dull, presumably because of the mid-week holiday. June volume, however, was good; in the case of one important dealer it was the largest June business since 1920. The General Electric Co. is buying for its refrigerating machinery department, its orders to date covering a considerable number of Acme and Brown & Sharpe automatic screw machines and Bliss presses and other miscellaneous tools. Fresh inquiries from this company have also been sent out, the latest asking for prices on four turret lathes, three radial drills, an engine lathe and a threading machine.

Wright Aeronautical Corporation, which is about to occupy a new unit added to its plant, is buying a large lot of equipment to carry out a production program of 250 airplane engines a month, more than doubling its present capacity. Original plan was to equip for 500 engines a month, but the remainder of this expansion will be deferred pending completion of a second plant addition. Combined purchases of General Electric Co. and Wright Aeronautical Corporation will run into hundreds of thousands of dollars. Railroad buying is at a minimum, but a sale of a locomotive axle journal turning lathe to a Western road is reported.

Plans have been approved by Union Bag & Paper Corporation, Woolworth Building, New York, for new mill at Vancouver, Wash., to cost approximately $250,000 with equipment, scheduled for completion in December. Columbia River Paper Mills, Vancouver, will furnish considerable paper stock for new plant and will carry out an expansion program to cost close to $150,000, including additional machinery.

Sylvestre Oil Co., Inc., Mount Vernon, N. Y., has purchased property on Newton Creek, New York, and plans early construction of new storage and distributing plant with capacity of 2,500,000 gal. A stock issue to total $250,000 is being sold, larger part of proceeds to be used for project.

Beam O'Lite Sign Co., New York, manufacturer of electric signs, etc., has leased space in building at 981 Eighth Avenue, for new local plant.

Levine & Wipkin, 11 West Forty-second Street, architects, have plans for a three-story automobile service, repair and garage building to cost in excess of $150,000 with equipment.

Long Island Motor Corporation, Long Island City, has leased a new one-story building on Sunswick Street for a service, repair and garage unit, including machine and parts departments.

Edward Purvis & Son, York and Jay Streets, Brooklyn, manufacturers of mechanical equipment, have acquired plant of Bucyrus Road Machinery Co., Bucyrus, Ohio, bankrupt, which has been idle for about five years, for a price of $52,500, and will take possession at once. Works will be remodeled for production of air compressors, engines and kindred equipment.

Ovens, power equipment, conveying machinery and other equipment will be installed in new three-story plant to be erected by Cushman's Sons, Inc., 1819 Broadway, New York, at White Plains, N. Y., to cost about $350,000. Francisco & Jacobus, 511 Fifth Avenue, New York, are architects.

J. F. Perrine, 31-35 Buell Street, East Elmhurst, L. I., architect, has plans for a one-story automobile service, repair and garage building, 100 x 200 ft., to cost $100,000 with equipment.

Board of Education, Pelham, N. Y., contemplates installation of manual training equipment in addition to Memorial High School, Pelham Manor, to cost in excess of $400,000. Charles M. Hart, Pelham Manor, is architect.

John A. Panzer, operating an automobile service and garage building at 1045 Bay Street, St. George, S. I., New York, has formed Lexington Garage & Auto Parts Co. New organization has acquired

The Crane Market

NEW inquiry for locomotive and overhead cranes has been light, but there is some good business pending, particularly in the export field. Bids have been submitted on overhead traveling cranes for South Africa and Turkey and on locomotive cranes and steam shovels for shipment to Argentina, Turkey, Persia and South America construction projects. Action on the list of locomotive cranes and steam shovels inquired for by Dwight P. Robinson & Co., New York, for export to Buenos Aires, Argentina, is expected about Aug. 1. The Galion Iron Works & Mfg. Co., Galion, Ohio, is in the market for a used 5 to 7-ton, 75 to 90-ft. span overhead crane for yard service.

Among recent purchases are:

New Jersey Zinc Co., New York, 10-ton crawl-tread locomotive crane from Orton Crane & Shovel Corporation.

E. I du Pont de Nemours & Co., chemical products division, Parlin, N. J., 25-ton, 8-wheel, locomotive crane from Orton Crane & Shovel Corporation.

International Railway Co., Buffalo, N. Y., 25-ton standard locomotive crane from unnamed builder.

General Electric Co., 15-ton overhead traveling crane from Niles Crane Corporation.

property on Pleasant Plains Boulevard, Tottenville, and plans construction of new main works, including repair and parts departments, to cost more than $80,000.

Hale Desk Co., 7 East Forty-fourth Street, New York, has leased seven-story and basement building at 531-35 West Thirty-seventh Street, totaling 110,000 sq. ft. floor space, for new plant and will remove to new location.

New York Dock Co., 44 Whitehall Street, New York, has awarded general contract to White Construction Co., 95 Madison Avenue, for new multi-story factory and distributing plant at Brooklyn, totaling about 900,000 sq. ft. of floor space, to cost more than $2,000,000 with equipment.

Wright Aeronautical Corporation, Railway Avenue, Paterson, N. J., has awarded general contract to John W. Ferguson Co., 152 Market Street, for two four-story additions, each about 300 ft. long, to cost in excess of $600,000 with equipment.

Radio Tube Corporation, 88 Eighth Avenue, Newark, has taken out a permit for a new three-story plant, to cost $75,000 with equipment. Siegler & Greenberg, 164 Market Street, are architects.

Air Marine-Klemm Corporation, recently organized by Inglis M. Uppercu, head of Uppercu-Cadillac Corporation, 536 Broad Street, Newark, will take over a portion of plant of Aeromarine Plane & Motor Co., Keyport, N. J., for a new works for manufacture of low-powered monoplanes, including parts and assembling divisions, to be known as Klemm-Daimer airplane. Hans Klemm, designer, will be an official of new company, in charge of production.

Austin Furnace Co., 105 Avenue L, Newark, has filed plans for new storage and distributing plant to cost about $175,000 with equipment.

United States Aircraft Co. of New Jersey, Inc., care of Joseph H. Edgar, 5 Elm Row, New Brunswick, N. J., recently formed by Condit S. Atkinson, Jr., Highland Park, N. J., and associates, with capital of $125,000, plans operation of plant in this section for production of airplanes.

Jersey City Cadillac Co., 2401 Boulevard, Jersey City, N. J., local representative for Cadillac automobile, has awarded general contract to Billington & Son, 198 Fairmount Avenue, for two-story service, repair and garage building at North Bergen, N. J., to cost about $125,000 with equipment. C. G. Eicholz, Jr., State Theater Building, Union City, N. J., is architect.

Manning, Maxwell & Moore, Inc., 100 East Forty-second Street, New York, has purchased American Schaeffer & Budenberg Corporation, with plants at Brooklyn and Worcester, Mass., manufacturer of industrial recording instruments, and will consolidate business with that of Consolidated Ashcroft Co., Inc., manufacturer of valves, indicating and recording instruments, which is controlled by Manning, Maxwell & Moore. Change in operation will take place at once.

New England

BOSTON, July 9.—The machine tool market in the territory the past week has been inactive, due in part to a large number of New England industrial plants taking inventory. The Boston & Albany Railroad is reported to have practically finished its purchases of a list of some 25 tools. Other business was confined for the most part to a few used tools for shops in the Boston district. The city of Boston has not yet closed on its Hyde Park district school machinery requirements and no definite information is had as to when purchases will be made. New inquiries continue scarce. Small tools are selling freely.

A report issued by Associated Industries of Massachusetts shows that metal working companies operated at 100.1 per cent of capacity in May, contrasted with 90.9 per cent in April and 96.8 per cent in May, 1927. A Government department report covering June operations shows a falling off in that month but because of incomplete data upon which a basis was made exact figures, in percentages, are withheld.

Worcester Taper Pin Co., Worcester, Mass., which recently absorbed Christianson Screw Co., Newton, Mass., is located at 9 May Street, Worcester. Thomas Crabtree is president and treasurer. Frank Calverly is superintendent and O. A. Jones sales manager.

Providence, R. I., has plans for a repair shop for its fire department to cost, without equipment, $80,000.

Plans have been filed by Hartford Gas Co., Hartford, Conn., for one-story machine equipment building to cost $60,000.

Millbury Steel Foundry Co., Millbury, Mass., is planning one-story addition, 60 x 100 ft., to be used primarily for power plant service, to cost close to $50,000 with equipment.

American Thermos Bottle Co., Norwich, Conn., is planning for new unit to total about 42,000 sq. ft. floor space, to double present capacity, to cost more than $100,000 with equipment.

Fellows Brass & Iron Foundry, Waterville, Me., has acquired former factory of Bent Bed Co., Medford, Mass., for new main plant and will remove to new location. Capacity will be increased.

Beaudette Mfg. Co., Crescent Avenue, Chelsea, Mass., manufacturer of radio equipment, has plans for two-story addition, to cost in excess of $40,000 with machinery. Schein & Levine, 448 Broadway, are architects.

Meisel Press Mfg. Co., 944 Dorchester Avenue, Dorchester, Boston, manufacturer of printing presses, has awarded general contract to W. H. Bailey Co., 88 Broad Street, Boston, for one and two-story addition, 100 x 220 ft., to cost close to $150,000 with equipment.

Maine Steel Products Co., South Portland, Me., recently organized, has taken over local plant and business of Marine Hardware Equipment Co., and plant and assets of Union Iron Works, Bangor, Me. A general expansion program will be carried out at both plants for increased output of snow plows and other snow removal machinery, as well as marine and affiliated hardware products. George C. Soule is head of new company.

City Building Department, City Hall, Providence, R. I., T. J. H. Pierce, city architect, is having plans drawn for a municipal repair and equipment shop to cost close to $60,000.

Pittsburgh

PITTSBURGH, July 9.—Following recent purchase of plant and business of Zenith Aircraft Co., Scottdale, Pa., by Charles Semans, Uniontown, Pa., and associates, arrangements are being made for immediate removal of works to a building at last-noted place, where increased production facilities will be provided.

Harbison-Walker Refractories Co., Farmers Bank Building, Pittsburgh, has abandoned plans for present for construction of new plant on large tract recently acquired on Patapsco Avenue, Baltimore, to cost more than $500,000, and project will be held in abeyance.

Keystone Sand & Supply Co., 302 Penn Avenue, Pittsburgh, has work under way on new sand and gravel handling and storage plant on South Third Street, to include a battery of 10 elevated steel bins, ground bins, conveying and loading equipment, and other handling apparatus; a boiler plant will be installed. Entire project is reported to cost more than $125,000.

W. L. Mack of Erie Engine Works, Erie, Pa., manufacturer of stationary engines, parts, etc., is at head of new company, to be known as Thermal Unit Corporation, to operate a plant in vicinity of New York for manufacture of heat transmission equipment, including piping, tubing, etc. Walter A. Curtzo, Erie, is also interested in new organization.

United States Aluminum Co., New Kensington, Pa., is planning a one-story addition, to cost in excess of $40,000 with equipment. E. S. Fickes is chief engineer, in charge.

Board of Allegheny County Commissioners, City-County Building, Pittsburgh, R. G. Woodside, in charge, is considering establishment of a new airport to cost more than $500,000, including hangars, repair shops, oil storage and distributing works and other mechanical units.

Duquesne Light Co., 436 Sixth Avenue, Pittsburgh, will make extensions and improvements in station and system at Midland, Pa., to cost about $25,000.

C. H. Mussleman Co., Biglerville, Pa., has acquired property at Ranson, W. Va., and plans early construction of new canning and evaporating plant, reported to cost more than $50,000 with equipment.

Philadelphia

PHILADELPHIA, July 9.—Bids will be received by Day & Zimmermann Engineering & Construction Co., 1600 Walnut Street, Philadelphia, acting for Board of Trustees, Eastern State Penitentiary, until July 16 for gasoline-driven concrete mixers, non-tilting type, with power loading attachment and water tank, mounted on steel wheels, for penitentiary near Graterford, Pa.

Columbia Steel Equipment Co., Third and Annsbury Streets, Philadelphia, manufacturer of steel filing equipment, has awarded contract to Harry H. Wehmeyer, 509 West Cumberland Street, for a second story addition to factory unit, 66 x 75 ft.

Simon Kaplan, 243 South Sixty-second Street, Philadelphia, has filed plans for a four-story automobile service, repair and garage building, to cost about $90,000 with equipment.

York Ice Machinery Co., Belmont and Thompson Streets, Philadelphia, manufacturer of ice-making and refrigerating equipment, with headquarters at York, Pa., will soon begin erection of new three-story and basement factory unit, to cost close to $100,000 with equipment.

Universal Service Motors Co., Broad and Pine Streets, Philadelphia, has taken over property at Second and Sansom Streets, totaling about 15,000 sq. ft. ground space, and plans erection of seven-story service, repair and garage building, to cost about $175,000 with equipment.

Well-Bilt Furniture Co., Philadelphia, has leased four-story factory at 337 North Second Street, totaling about 50,000 sq. ft. floor space, for new plant.

Edward H. Reuss, Jr., Thirtieth and Race Streets, Philadelphia, manufacturer of pipe, heating equipment, etc., and associates, have organized Philadelphia Steam Co., for which application for State charter will be made, to construct and operate a central steam power plant for heating service. Walter B. Reed and J. Percy Bell, care of Frank M. Hunter, Gibson Building, Chester, Pa., are interested in new company.

City Council, Beach Haven, N. J., has awarded general contract to Floyd L. Cranmer, Beach Haven, for addition to municipal electric light and power plant, to cost about $50,000 with equipment. William H. Boardman is engineer, in charge.

Board of Education, Pleasantville, N. J., plans installation of manual training equipment in new three-story high school to cost $635,000, for which revised plans have been approved and bids will be asked at once on general contract. S. Hudson Vaughn, Guarantee Trust Building, Atlantic City, N. J., is architect.

City Council, Reading, Pa., plans installation of pumping machinery and other power equipment in connection with a 40,000,000-gal. mechanical filtration plant, to cost more than $650,000.

Oliver United Filters, Inc., has been formed to take over and consolidate United Filters Corporation, Hazleton, Pa., and Oliver Continuous Filter Co., Oakland, Cal., manufacturers of industrial filters and filtering machinery. Both plants will be continued in service. New company will dispose of stock issue to total about $2,600,000, a portion of fund to be used for expansion and betterments. E. J. Sweetland, formerly president of United company, will be chairman of board, and Edwin L. Oliver, president.

Lehigh Valley Cold Storage Co., Bethlehem, Pa., will make extensions and improvements in cold storage plant, including installation of new ice-manufacturing division, to cost in excess of $200,000 with machinery.

Board of Education, Altoona, Pa., plans installation of manual training equipment in new two and three-story and basement high school, to cost $750,000, for which bids are being asked on general contract until July 20. Hersh & Sholler, Commerce Building, are architects.

E. D. Hawk, New Castle, Pa., and associates have taken over former plant of Slagstone Products Co., East New Castle, and will remodel for production of electric storage batteries and kindred products.

Natural Products Co., Inc., 46 West Chestnut Street, Reading, Pa., has been formed to operate warehouse for distribution of foundry supplies and operate sand banks. Warren S. Adams is president.

So. Atlantic States

BALTIMORE, July 9.—Contract has been let by Standard Fertilizer Co., Inc., Williamston, N. C., subsidiary of Standard Wholesale Phosphate Co., Continental Building, Baltimore, to S. S. Toler, Rocky Mount, N. C., for second unit of plant, to cost more than $45,000 with equipment. Work will include a new wharf and shipping facilities.

City Council, Front Royal, Va., is completing surveys for new municipal airport on 40 acre site, to include hangar, repair shop, oil storage and distributing building, and other units.

Otto Equipment & Service Co., Thirty-third Street, Philadelphia, manufacturer of gas engine equipment, has leased space in building at Guilford Avenue and Saratoga Street, Baltimore, for factory branch and distributing plant.

Stribling Aircraft Co., Macon, Ga., care of W. L. Stribling, Macon, recently organized by Mr. Stribling and son, is negotiating for lease of Miller Field for establishment of aircraft works, including repair and parts shops, oil storage and distributing building and other structures. Company will also establish and operate a flying school; it will be capitalized at $250,000.

Bedford Pulp & Paper Co., Bedford, Va., is planning construction of hydroelectric power plant on James River, near Snowden, Amherst County, for power supply for pulp and paper mill.

International Paint Co., 1828 West North Avenue, Baltimore, is said to be planning new three-story plant at Dundalk, to cost about $75,000 with equipment. C. R. Sutter is general manager.

Tidewater Body & Fender Works, Inc., Norfolk, Va., recently formed by B. W. Woodard, 418 New York Avenue, and associates, with capital of $50,000, plans operation of sheet metal works, for which details will soon be completed.

General purchasing officer, Panama Canal, Washington, will receive bids until July 27 for cranes, floor grinders, tool grinders, locomotive castings, metal cabinets, hacksaw blades, drills, wrenches, pumps, motor-generator set, electric rivet heaters and other mechanical and electrical equipment, Panama schedule 1887.

Lexington Water Power Co., Columbia, S. C., operated by General Gas & Electric Corporation, 50 Pine Street, New York, has work in progress on new hydroelectric generating plant on Saluda River, about 10 miles from Columbia, and is scheduling completion late in 1930. Miscellaneous equipment awards will be made soon.

Georgia Manganese & Iron Co., 201 Hurt Building, Atlanta, Ga., has engaged Perin & Marshall, 40 West Fortieth Street, New York, consulting engineers, to complete plans for its development of manganese ore properties near Cartersville, Ga., including installation of mining and refining equipment, with mechanical washing plant. Entire project is reported to cost close to $1,500,000. Joel Hurt is head.

Peoples Ice & Storage Co., Wilson Street, Roanoke, Va., is planning erection of seven-story ice-manufacturing and cold storage plant, 150 x 160 ft., to cost in excess of $100,000 with equipment.

Rose Clic Co., Waynesboro, Va., plans rebuilding machine shop recently destroyed by fire, with loss, including portion of packing plant, about $30,000 with equipment.

Detroit

DETROIT, July 9. — Arrangements have been completed by Alloy Steel Spring & Axle Co., Jackson, Mich., for purchase of local plant and business of National Plating & Enameling Co., and will operate in future as a division of organization. Expansion in output is under consideration.

Consumers Power Co., Jackson, Mich., has approved plans for an addition to steam-operated electric power plant at Ziiwaukee, near Saginaw, Mich., to include installation of new 35,000-kw. turbo-generator unit; four boilers, with economizers, air pre-heaters, and auxiliary equipment; pumping equipment, etc. Increase will also be made in transmission system. Entire project will cost in excess of $2,000,000.

Chevrolet Motor Co., 3044 West Grand Boulevard, Detroit, has awarded general contract to Kansas City Structural Steel Co., Kansas City, Mo., for new assembling plant at Leeds, Mo., 300 x 760 ft.; body building plant, 170 x 760 ft.; service and parts unit, 120 x 275 ft.; power house, 46 x 70 ft.; office and miscellaneous structures, all one-story, to cost in excess of $1,000,000 with equipment. A loading dock, 40 x 220 ft., will also be built. Albert Kahn, Marquette Building, Detroit, is architect.

George Bachman, Flint P. Smith Building, Flint, Mich., architect, will soon take bids on general contract for three-story automobile service, repair and garage building, to cost about $125,000 with equipment.

Forham Tool Co., Detroit, care of Lane, Davenport & Peterson, Charlevoix Building, architects, is having plans drawn for new two-story plant to cost about $65,000 with equipment.

Pontiac Foundry & Machine Co., Pontiac, Mich., recently organized with capital of $75,000, has taken over building

on Scott Lake Road, previously used by Howard Foundry Co., for new plant for production of brass, bronze and aluminum castings for automotive and aircraft industries; department will be established for manufacture of metal patterns, as well as dies, and kindred specialties. Robert Falstead, Birmingham, Mich., heads company.

Kalamazoo Stationery Co., Harrison Street, Kalamazoo, Mich., has plans under way for new power plant at factory to cost $50,000 with equipment. Billingham & Cobb, 211 Woodward Avenue, are architects.

Jackson Screw Products Co., Jackson, Mich., will rebuild portion of plant destroyed by fire July 4, with loss reported at $40,000 including equipment.

Motor Products Corporation, 11801 Mack Avenue, Detroit, manufacturer of metal stampings for automotive service, is said to be planning a one-story addition, to cost more than $45,000 with equipment.

Cleveland

CLEVELAND, July 9.—Machine tool sales took quite a spurt the past week. There was a fair volume of activity in single machines well distributed among various industries and several orders were for good sized lots. Some new demand sprang up from makers of automobile parts in both the Cleveland and Detroit territories, although no buying is reported by automobile manufacturers. The National Acme Co., Cleveland, purchased 10 presses and drilling machines for extending its facilities for manufacturing shock absorbers. The Gairing Tool Co., Detroit, bought 10 automatic screw machines. The Fulton Syphon Co., Knoxville, Tenn., bought seven turret lathes. The Timken Roller Bearing Co., Canton, Ohio, has issued a small list of machinery requirements for its maintenance department, which includes lathes, bolt cutters and horizontal boring mills.

Thompson Products Co., Inc., Cleveland, maker of valves and other automobile parts, will spend $750,000 on additions to plants. A two-story extension, 62 x 122 ft., will be built at its Cleveland plant and a two-story extension, 100 x 140 ft., to its Detroit plant. Plans also contemplate erection next year of two other units at Cleveland for machine shop and heat treating departments and another unit in Detroit for a forging department.

Merger of four leading manufacturers of rubber making machinery has been concluded. Companies comprise Akron Rubber Mold & Machine Co. and Quhlke Machine Co., Akron, Ohio; Banner Machine Co., Columbiana, Ohio, and DeMattia Brothers, Inc., operating a foundry and machine shop in New Jersey. Stanley Harris, president Akron Mold & Machine Co., is temporary president of new organization; Barthold DeMattia, vice-president, and M. D. Quhlke, secretary.

Eaton Axle & Spring Co., Cleveland, has acquired Easy-on-Cap Co., Cleveland, maker of gasoline tank, breather tube, radiator and crank shaft caps. Latter company will continue under present management in a new plant containing 50,000 sq. ft. of floor space, which will be erected on a site adjoining East 140th Street plant of Eaton Axle company. Hub caps will be added to present products.

Cleveland Duplex Machinery Co., Inc., Cleveland, has been appointed agent in northeastern Ohio for Grant Mfg. & Machine Co., Bridgeport, Conn., in sale of rivet spinners, vibrating riveters, double end threading and chamfering machines and special machinery.

Massillon Rivet & Mfg. Co., 614 Erie Street, South, Massillon, Ohio, has been formed to succeed Canton Bolt Co., Canton, Ohio, and has removed to plant at Massillon where facilities for manufacture of small rivets has been increased. Company is equipped to manufacture steel, brass, copper, aluminum and enduro metal rivets in following coatings and finishes: Galvanized, metallic tinned, tin plated, coppered, nickel plated, brass plated, copper plated and bright polished after annealing.

Contract has been let by Gears & Forgings, Inc., East Ninety-second Street, Cleveland, to R. S. Ursprung, Berea, Ohio, for a one-story addition, 50 x 135 ft., to cost about $45,000, with equipment.

Libbey-Owens Sheet Glass Co., Nicholas Building, Toledo, Ohio, has awarded general contract to A. Bentley & Sons Co., 201 Belmont Avenue, for new plant primarily for manufacture of laminated safety glass products, to cost $1,500,000 with equipment. Lockwood, Greene & Co., 400 North Michigan Boulevard, Chicago, are architects and engineers.

Henry & Murphy, Second National Bank Building, Akron, Ohio, architects, have completed plans for two-story automobile service, repair and garage building on South High Street, reported to cost close to $90,000, with equipment.

Ohio Foundry Co., 2469 East Seventy-first Street, Cleveland, has awarded general contract to H. B. Slatmyer & Son Construction Co., 203 Lakeside Avenue, for one-story addition to cost approximately $100,000 with equipment.

Cincinnati

CINCINNATI, July 9.—While some machine tool builders report a recession in sales since the first of the month, bookings have held up fairly well. Agricultural implement makers have been the largest buyers of equipment, their purchases in this market having included engine lathes, drilling machines and special high production tools. Notable among the week's bookings has been a sale of 15 18-in. motor-driven engine lathes to a Middle West manufacturer. A local company has received an order for three engine lathes from a South American company and also will supply a gap lathe to a Canadian firm. The Boston & Albany has bought several tools and the Rock Island is said to be inquiring for a few machines.

Stanton Motors, Inc., 841 North High Street, Columbus, has plans for two-story and basement service, repair and garage building, to cost close to $100,000 with equipment. Richards, McCarty & Bulford, Columbus, are architects.

Kentucky River Coal Co., Fayette National Bank Building, Lexington, Ky., W. S. Dudley, president, is reported planning construction of pipe line for natural gas supply from its coal mining properties to vicinity of Knoxville, Tenn., with compressor plants, etc.

Adrian Knitted Products Co., Dyersburg, Tenn., plans construction of steam power house in connection with a new local mill, entire project to cost close to $200,000. Robert & Co., Bona Allen Building, Atlanta, Ga., are architects and engineers. Headquarters are at Adrian, Mich.

Van Buren Township Board of Education, Dayton, Ohio, care of Walker & Norwick, American Building, architects, plans installation of manual training equipment in new high school to cost about $450,000, for which bids will be asked on general contract by architects noted.

Air Corps, Material Division, Wright Field, Dayton, Ohio, will receive bids until July 19 for runner assemblies, cable assemblies, cord assemblies, ski assemblies, and shock absorber assemblies, circular 33.

Dudney Tire Co., Nashville, Tenn., has leased building to be erected at 1217-21 Broadway, for new factory branch, service and distributing plant to cost $100,000; general contract let to J. J. Dugger, Carmack Avenue.

Ovens, power equipment, conveying and other machinery will be installed in new two-story and basement plant, 60 x 200 ft., to be erected by Linker Brothers, 1129 West Market Street, Louisville, on adjoining site, to cost about $115,000. D. X. Murphy & Brothers, Louisville Trust Building, are architects.

Buffalo

BUFFALO, July 9.—Bids will soon be asked by International Casement Co., Hopkins Avenue, Jamestown, N. Y., manufacturer of steel casements, casement adjustments, etc., for a one-story addition, to cost close to $40,000 with equipment. Beck & Tinkham, Bailey Building, are architects.

Hecker, Jones, Jewell Milling Co., St. Clair Avenue, Buffalo, has filed plans for a new mill unit to be equipped for mechanical washing and drying, to cost $50,000.

Frank B. Floyd, 110 Eloise Terrace, Syracuse, N. Y., and associates, have organized Smith Trailer Corporation and plan early operation of plant for manufacture of trailers and other agricultural equipment. George G. Heidlauf, 126 Coleridge Avenue, is also interested in company.

City Council, City Hall, Lockport, N. Y., will receive bids until July 23 for motor-driven centrifugal pumping equipment for high and low service, standpipe addition, valves, and other equipment for filtration plant. J. N. Chester Engineers, Clark Building, Pittsburgh, are engineers.

Board of Education, Watertown, N. Y., is considering installation of manual training equipment in new South Side junior high school, to cost $450,000, for which bids will soon be asked on general contract on revised plans. Lansing & Green, Sherman Trust Building, are architects.

Cortland County Traction Co., Cortland, N. Y., operating electric light and power utilities, has secured permission to make extensions in transmission lines and facilities for service at Virgil, N. Y., and vicinity.

Remington Rand, Inc., Buffalo, manufacturer of office equipment, has removed its general purchasing department from Ilion, N. Y., to Remington Rand Building, 465 Washington Street, Buffalo. L. Rayburn is director of purchases.

Chicago

OF special interest in this market is activity among farm implement manufacturers and builders of tractors in laying out programs for machine tool needs for production schedules at the opening of 1929. Meantime these industries continue to place orders in good volume for their immediate needs. This business, plus that which is coming from gasoline engine builders, has held the first week in July on a par with the closing seven-day period in June. The new month makes a good start when compared with July, 1927.

The Chicago & North Western is in the market for an axle lathe, pattern grinding and filing machine and a drill grinder. The Illinois Central is asking for prices on rebuilding a number of old lathes. The Louisville & Nashville is preparing a sizable list for its shops near the new State docks, Mobile, Ala. Used machinery is moving in good volume.

Emerson - Brantingham Corporation, Rockford, Ill., has announced sale of its farm machinery plant at Rockford and its farm machinery inventory at works and branches to J. I. Case Threshing Machine Co., Racine, Wis., effective Aug. 1.

Martin Machine Works, 220 Laflin Avenue, Chicago, will build a factory, 48 x 125 ft., to cost $18,000.

Bids will be received by Board of Trustees, Springfield Sanitary District, City Hall, Springfield, Ill., until July 25 for equipment for municipal sewage plant, including centrifugal sump pumps, sludge pumps and hot water circulating pumps; two motor-driven air blowers, 2200 and 3300 cu. ft. per min., capacity, respectively; and electrical equipment, with seven-panel power switchboard. Pearse, Greeley & Hansen, 6 North Michigan Avenue, Chicago, are engineers.

School District No. 45, 422 South Fairview Avenue, Elmhurst, Ill., I. A. Stone, secretary, is considering installation of manual training equipment in three-story addition to York high school to cost $350,000, for which plans are being drawn by J. C. Llewellyn, 38 South Dearborn Street, Chicago, architect.

Chicago Metal Spinning Co., 1715 Walnut Street, Chicago, has work nearing completion on new two-story and basement plant unit, 38 x 53 ft.

American Wood Products Co., 258 S. E. Cecil Street, St. Paul, Minn., will soon take bids for new two-story plant, to cost about $90,000 with equipment.

Produce Terminal Cold Storage Co., Chicago, care of Henschien & McLaren, 1637 Prairie Avenue, architects, will proceed with superstructure for a new eleven-story cold storage and refrigerating plant on West Fifteenth Place, 108 x 220 ft., to cost close to $2,000,000 with machinery. Work is scheduled for completion by close of year when it is purposed to begin erection of a second unit adjoining.

Community Motor Co., Thirty-third Street and Prairie Avenue, Chicago, has taken out permit for a two-story service, repair and sales building, 128 x 177 ft., to cost close to $90,000 with equipment. L. E. Russell, 140 South Dearborn Street, is architect.

Public Service Co. of Colorado, 900 Fifteenth Street, Denver, Colo., has filed plans for a one-story foundry and shop, 40 x 60 ft. and 20 x 32 ft.

Newton Mfg. Co., Newton, Iowa, manufacturer of advertising novelties, has approved plans for a two-story addition to cost about $40,000 with equipment.

Caterpillar Tractor Co., East Peoria, Ill., is contemplating erection of new one-story foundry, to cost approximately $50,000 with equipment. Headquarters are at Oakland, Cal.; M. M. Baker is local manager at East Peoria.

Northern Pacific Railroad Co., St. Paul, Minn., has plans for new one-story steel car construction and repair shops at Laurel, Mont., to cost upward of $160,000 with equipment.

Albertson & Co., Sioux City, Iowa, manufacturers of tools and shop equipment, will build an addition to factory to cost $100,000 for expansion of production facilities.

O. C. Keckly Co., Chicago, has acquired controlling interest in Lourie Mfg. Co., Harvard Park, Springfield, Ill., and offices at latter city are being transferred to Chicago. H. M. Alkire, vice-president in charge of manufacturing, states that expansion of Springfield unit is contemplated. Lourie line of hydraulic presses will be continued and in addition Keckly company will install equipment for manufacture of water gage specialties.

Indiana

INDIANAPOLIS, July 9.—Syracuse Electric & Telephone Co., Syracuse, has plans for a one-story equipment storage and distributing plant, with utility and repair department, 40 x 100 ft. Bradley & Babcock, 221 West Wayne Street, Fort Wayne, are architects.

Refrigerating equipment, conveying and other machinery will be installed in new plant to be built by Emge Packing Co., Fort Branch, to cost about $100,000, for which building contract has been let to Scarborough & Davis, Old State Bank Building, Evansville.

Board of Park Commissioners, City Hall, Fort Wayne, has plans for hangars, with repair facilities, and other buildings at municipal airport, for which bids will soon be asked on general contract. Everett I. Brown, First National Bank Building, is architect.

Fame Canning Co., Shelbyville, Ind., is said to have plans for rebuilding portion of local plant recently destroyed by fire, to cost more than $150,000 with machinery. Headquarters are at 58 East Washington Street, Chicago.

Board of Education, Muncie, will soon lay foundations for one-story vocational training school to cost $150,000 with equipment, for which bids have been asked on general contract. Houck & Smenner, 108 East Washington Street, are architects.

Power equipment, cold storage and refrigerating machinery, conveying and other handling equipment will be installed in three-story addition, 110 x 256 ft., to be erected by Major Brothers Packing Co., South Logan Street, Mishawaka, to cost close to $500,000. Packers Architectural & Engineering Co., 431 South Dearborn Street, Chicago, is architect and engineer.

Leader Specialty Co., Inc., 517 East Walnut Street, Indianapolis, has been formed to manufacture plumbing specialties, particularly iron pipe nipples. Company plans first to manufacture nipples from standard steel pipe in sizes ranging from ⅛ x ¾ in. to 2 x 6 in.

Gulf States

BIRMINGHAM, July 9.—Moody Corporation, Galveston, Tex., operated by Moody-Seagraves Co., Esperson Building, Houston, Tex., has secured an interest in 480 acres of oil lands in Howard County, and plans immediate development. It is purposed to construct an oil refinery, in Big Springs, Tex., section, or in Galveston district, site still to be determined. Pipe line will be constructed from Howard oilfield to new refinery. Entire project is reported to cost in excess of $1,000,000 with equipment.

Burford Oil Refining Co., Shreveport, La., operated by Crystal Oil Refining Corporation, Shreveport, F. W. Burford, general manager, has begun construction of new oil refinery at Pecos, Tex., with an initial capacity of 5000 bbl. per day. A cracking plant will also be installed for gasoline production and complete treating equipment; also a boiler plant and machine shop. Entire project will cost close to $700,000 with machinery. J. J. Thomas is superintendent.

Tampa Union Terminal Co., 823 South Orleans Street, Tampa, Fla., has approved plans for a new cold storage and pre-cooling plant on 10-acre tract on Ybor Channel, to be eight stories, 150 x 152 ft; with two story transit shed, 100 x 465 ft.; and one-story power plant, 50 x 80 ft. Entire project will cost in excess of $700,000 with equipment. Parsons, Klapp, Brinckerhoff & Douglas, 84 Pine Street, New York, are engineers. Clyde Perry is president.

Transcontinental Oil Co., Fort Worth, Tex., is completing plans for construction of new pipe line from Pecos County oilfields to a point near Texas City, Tex., to cost more than $200,000. Headquarters are in Benedum Trees Building, Pittsburgh.

F. S. Royster Guano Co., Royster Building, Norfolk, Va., has approved plans for rebuilding its branch fertilizer plant at Birmingham, recently destroyed by fire, to cost close to $130,000 with equipment.

Duval Texas Sulphur Co., Second National Bank Building, Houston, Tex., is in market for two used steam-driven air compressors, 90 lb. steam pressure, 400 to 500 lb. air pressure, 350 to 500 cu. ft. per min.

Pan-American Airways, Inc., Miami, Fla., will proceed with construction of new airport on Thirty-sixth Street, where tract of about 130 acres recently was secured, to include hangars, 100 x 100 ft., with repair shops, parts and reconditioning units, and oil storage and distributing works, to cost in excess of $85,000.

Southern United Ice Co., Crystal Springs, Miss., is planning an addition to local ice and cold storage plant to cost approximately $50,000 with equipment. It is also proposed to build a new two-story unit at Jackson, Miss., to cost close to like sum. W. E. Wells, Inc., 100 West Monroe Street, Chicago, is engineer.

Firestone Tire & Rubber Co., Akron, Ohio, has purchased property at Jacksonville, Fla., and plans early construction of new factory branch and distributing plant, to cost approximately $100,000 with equipment.

Southern Phosphate Co., Bartow, Fla., is considering plans for new works at Sangully, vicinity of Tampa, Fla., for phosphate fertilizer manufacture, to cost close to $50,000 with machinery. Headquarters are at 44 Wall Street, New York.

Cotton Concentration Co., Forty-second Street and Avenue A, Galveston, Tex., has completed plans for one-story com-

press mill, 315 x 340 ft., to cost about $90,000 with machinery.

Texas Gulf Sulphur Co., Inc., Gulf, Tex., has awarded contract to J. G. White Engineering Corporation, New York, for initial units at local plant, including machine and other mechanical shops, steam power house of 7500 hp. capacity. Other units will be erected later. Headquarters are at 41 East Forty-second Street, New York.

Central Power & Light Co., Frost Building, San Antonio, Tex., has secured permission to proceed with a hydroelectric power project on Devils River, Val Verde County, with construction of power dam and installation of station, to cost more than $400,000.

St. Louis

ST. LOUIS, July 9.—Bids have been asked on general contract by Century Electric Co., 1806 Pine Street, St. Louis, for one-story and basement foundry, 240 x 262 ft., to cost in excess of $175,000 with equipment. Klipstein & Rathman, 316 North Eighth Street, are architects. J. L. Hamilton is company engineer and superintendent.

Pillsbury Flour Mills Co., Minneapolis, Minn., has work under way on a new milling plant and elevator, 75 x 300 ft., at Enid, Okla., to cost about $700,000 with machinery. Jones-Hettelsater Construction Co., Mutual Building, Kansas City, Mo., is general contractor.

Wabash Railway Co., Railway Exchange Building, St. Louis, will soon begin work on one and three-story fruit and produce exchange building, 60 x 640 ft., with ice and cold storage facilities, mechanical handling equipment, etc., to cost $800,000 with equipment. R. E. Mohr, address noted, is company architect; R. H. Howard is chief engineer.

Board of Education, Loomis, Neb., plans installation of manual training department in connection with rebuilding portion of high school recently destroyed by fire, with loss close to $50,000. H. P. Helleberg, Masonic Building, Kearney, Neb., is architect.

Chandeyson Electric Co., 4092 Bingham Avenue, St. Louis, manufacturer of electrical equipment, has filed plans for a one-story addition, 32 x 100 ft., to cost close to $25,000 with equipment. Widmer Engineering Co., Roosevelt Building, is engineer.

Spartan Aircraft Co., 902 North Wheeling Street, Tulsa, Okla., has awarded general contract to Austin Co., Cleveland, for a one-story and basement plant, 150 x 350 ft., to cost close to $250,000 with equipment. New unit will be used largely for assembling and parts production.

Camden Furniture Co., Camden, Ark., is planning for additions to double, approximately, present capacity, to cost about $50,000 with equipment.

Arkansas Natural Gas Corporation, Little Rock, Ark., is completing plans for construction of pipe line for natural gas supply from Clarksville, Johnson County, to Little Rock, about 100 miles, to cost in excess of $1,000,000 with booster stations and other auxiliaries. George T. Koch, Shreveport, La., is chief engineer in charge.

Normandy Consolidated School District, Normandy, Mo., has broken ground for two-story and basement manual training school, 60 x 270 ft., to cost about $120,000 with equipment. William B. Ittner, Board of Education Building, St. Louis, is architect.

Mertz Auto Body & Radiator Co., 235 North Sixth Street, East St. Louis, Ill., has asked bids on general contract for new one-story plant unit to cost about $32,000 with equipment. Seer-Ko Engineering Co., 1632 North Twenty-fifth Street, is architect and engineer.

Milwaukee

MILWAUKEE, July 9.—There has been no perceptible slackening in machine-tool business, and while orders are not of large volume, they are of fair number. Employment in industry is gaining and a good demand for skilled men for the metal trades is officially reported. It is interesting to note that 44 shops had 36,922 people at work at the beginning of July, compared with 36,777 at work in 46 shops on June 1. The reduction in number of reporting shops is caused by the sale of the Northwestern Malleable Iron Co. and the closing of another shop formerly reporting. The July 1 figure of 36,922 at work compares with 34,542 working in 46 factories a year ago.

National Enameling & Stamping Co., 909 St. Paul Avenue, Milwaukee, is placing contracts through Siebert & Kegler, local architects, for construction of a new administration building, 56 x 135 ft., two stories and part basement. Present office building will be converted for manufacturing.

Klug & Smith Co., consulting engineer, 69 East Wisconsin Avenue, Milwaukee, has general contract to build a brick and steel shop bay addition, 28 x 134 ft., for Smith Engineering Works, manufacturer of ore, rock and gravel handling machinery, 78 Capitol Drive.

Wisconsin Cold Storage Co., 178 Florida Street, Milwaukee, is asking bids through C. F. Ringer & Son, architects, 432 Broadway, for erection and equipment of an eight-story cold storage warehouse to cost $500,000. Henry C. Kuehn is secretary and treasurer.

J. D. Phillips, business manager Board of Regents, University of Wisconsin, Madison, will close bids July 23 for construction of a $60,000 tank house at university pumping station. Arthur Peabody is State architect.

J. W. Turner, proprietor of Turner's Garage, Elkhorn, Wis., will begin work Aug. 1 on a two-story automotive sales and maintenance building, 60 x 100 ft., at Delavan, Wis. Second story will be given over to service and repairs.

Gillette Rubber Co., 799 Wisconsin Avenue, Eau Claire, Wis., is at work on a four-story addition, 74 x 160 ft., costing about $75,000 complete. General contract for designing and erecting has been placed with Hoeppner & Bartlett Co., 414 East Grand Avenue, Eau Claire.

Armstrong Foundry Co., 1530 Junction Avenue, Racine, Wis., manufacturer of gray iron castings, has accepted bid of Nelson & Co., 408 Janes Building, for construction of an addition, 70 x 80 ft. Architect is J. Mandor Matson, Racine.

Young Radiator Co., Racine, Wis., manufacturer of radiators, cooling systems and heating units, has received year's contract from Chicago Pneumatic Tool Co., New York, for manufacture of radiators used on latter company's portable compressors.

Pacific Coast

SAN FRANCISCO, July 5.—An expansion and improvement program is being arranged by Holly Sugar Corporation, Tracy, Cal., at its beet sugar mill, including one-story wing addition to cost about $85,000, of which approximately one-half will be expended for equipment. Headquarters are at Colorado Springs, Colo.

East Bay Municipal District, 1924 Broadway, Oakland, Cal., will receive bids until Aug. 17 for hydraulic and electric power equipment for its Pardee power plant, Mokelumne River project. John H. Kimball is secretary.

Inglewood Union High School District, Inglewood, Cal., has authorized plans for a new high school group, including one-story manual arts building. Bond issue of $400,000 has been approved. T. C. Kistner & Co., Architects Building, Los Angeles, are architects.

Marconi Mfg. Co., Seattle, care of Hancock & Lockman, Walker Building, architects, has completed plans for new two-story radio equipment manufacturing factory, 50 x 160 ft., to cost about $55,000 with machinery.

Whitehouse & Price, Hutton Building, Spokane, Wash., architects, have completed plans for a multi-story automobile service, repair and garage building for City Ramp Garage, Inc., Hutton Building, to cost $200,000 with equipment.

Board of School Trustees, Pomona, Cal., has plans for a new junior high school group, with one-story manual arts unit, 50 x 160 ft. A bond issue of $300,000 has been arranged for project. T. C. Kistner & Co., Architects Building, Los Angeles, are architects.

City Council, Idaho Falls, Idaho, has been authorized to issue bonds for $100,000 for extensions and improvements in municipal hydroelectric power plant and completion of power dam on Snake River.

C. W. McCall, 1404 Franklin Street, Oakland, Cal., architect, has completed plans for one-story automobile service, repair and garage building, to cost close to $100,000 with equipment.

Kinney Iron Works, 2724 Santa Fe Avenue, Vernon, Los Angeles, has awarded general contract to J. C. Flick, Huntington Park, Cal., for a one-story shop unit.

Southern California Edison Co., Third Street and Broadway, Los Angeles, has filed plans for one-story automobile service, repair and garage building for company trucks, 75 x 185 ft., to cost about $70,000 with equipment.

Associated Oil Co., 79 New Montgomery Street, San Francisco, has applied for permission to construct three new pipe lines from its properties in Potrero field to Rosecrans, and from latter point, another pipe line to Wilmington, Los Angeles, to cost more than $350,000.

F. & F. Six Wheel Co., 220 East Market Street, Los Angeles, has been formed to manufacture six wheel frame extensions for trucks, particularly applicable to Ford models. Work is being done under contract and manufacturing is being concentrated at Los Angeles.

Carter Steel Products Co., 1934 South San Fernando Road, Glendale, Cal., has been formed to manufacture novelty steel buildings. Company has purchased plant at above address, which is in operation, and will purchase light structural steel, sheets, windows, doors and other building products.

Van Dorn Electric Tool Co., Cleveland, has established warehouse and service station at 525 East Tenth Street, Oakland, Cal., to supplement sales branches in Los Angeles, San Francisco and Seattle and service branches at Los Angeles, Oakland and Seattle. Complete stocks of Van Dorn and Van Norman products will be carried and shipments made to Pacific Coast points directly from new warehouse. Sales branches will be operated at 857 South San Pedro Street, Los Angeles; 75 Fremont Street, San Francisco, and 514 Virginia Street, Seattle, in charge of Waldo H. Bair, Harry W. White and Roy Wise respectively.

Eugene Luckey, Inc., Portland, Ore., manufacturer of piston rings, will remove factory and sales room to Broadway and Flanders Street.

Hooker Electrochemical Co. has plans for a $1,000,000 plant at Tacoma, Wash., construction to start immediately. This will be a main branch of company headquarters which are at Niagara Falls, N. Y.

L. G. Bradfield Co., located in central manufacturing district, Los Angeles, is erecting an addition to its factory to increase floor space 50 per cent and double production. Approximately $30,000 will be spent for land, equipment and building. A considerable quantity of machine tools will be purchased. William P. Neil Co., Inc., have general contract.

Canada

TORONTO, July 9.—Machine tool business for June showed improvement over that for May and, according to builders and dealers, was one of the best months this year. During the first week of July, however, sales fell off sharply and interest was confined mostly to inquiry. New business in prospect is of diversified character and covers practically all industrial activities. Building programs by industrial companies are numerous with many new plants under construction or in prospect.

Robert Mitchell Co., Montreal, has leased an iron foundry near its plant, belonging to Thomas Davidson estate, to relieve congestion in its foundry. Company manufactures architectural bronze and wrought iron, metal fittings and fixtures for railroad passenger cars.

Queenston Quarries, Ltd., Queenston, Ont., will start work soon on an addition, 60 x 100 ft., to cost $40,000.

Gardner Construction Co., Ltd., 22 Cross Street, Welland, Ont., has been awarded contract for construction of a one-story addition, 60 x 160 ft., to plant at Crowland Township, Ont., for Page-Hersey Tubes, Ltd., Church Street, Toronto.

Church Ross Co., 901 Keefer Building, Montreal, has general contract for building a four-story factory for Congoleum Co. of Canada, Ltd., 1170 St. Patrick Street, Montreal, to cost $100,000. Architects are Hutchison & Wood, 86 Notre Dame Street West.

Bulk tenders are being received by E. Bamber, Kerr Street, Oakville, Ont., until July 16 for erection of a one-story factory, 60 x 300 ft., for General Metal Devices, Ltd. R. Card, 142 Chester Avenue, Toronto, is architect.

Brigham & Woolrich, 201 Fifth Avenue East, Owen Sound, Ont., has been awarded contract for one-story addition, 50 x 100 ft., to plant of Empire Stove & Furnace Co., Third Avenue East.

Church Ross Co., Ltd., Montreal, has been awarded contract for erection of a $250,000 addition to plant of the American Can Co., 2065 Jeanne d'Arc Street. Building will be five stories, 120 x 200 ft., of reinforced concrete.

Arco Paint Co., Cleveland, has purchased five acres on Weston Road, York Township, Ont., for erection of a three-story factory, 80 x 100 ft., to cost $100,000. Plans call for completion by Oct. 1.

Western Canada

Plans and specifications for terminal facilities and cold storage plant of Pacific Coast Terminals, Ltd., New Westminster, B. C., have been filed. Plans call for a four-story cold storage warehouse, power house, ice manufacturing plant, wharf and warehouse trackage and timber and general storage docks. Project will cost approximately $2,000,000.

Knox Brothers, Montreal, are reported to be arranging for erection of a sawmill, dry kilns and wharf at North Vancouver, B. C.

Imperial Oil Ltd., Calgary, Alta., has started work on a two-story addition, 120 x 200 ft., to its plant and offices at 2066-9th Avenue West.

General Motors of Canada, Ltd., head office, Oshawa, Ont., has awarded contract to Smith Bros. & Wilson, Ltd., Eighth avenue and Ottawa Streets, Regina, Sask., for an assembling plant at Regina to cost $1,000,000. Hutton & Souter, 6 James Street South, Hamilton, Ont., are architects.

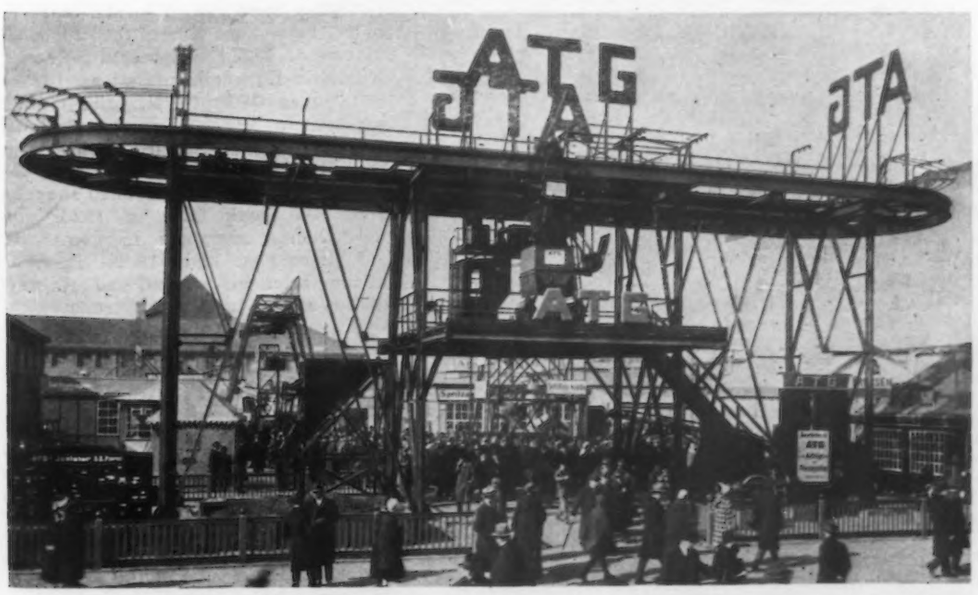
Foreign

PLANS have been approved by Continuous Coal Carbonization, Ltd., London, for first unit of new plant at Erith, on Thames River, to be equipped for ultimate capacity of 1000 tons of coal per day to cost in excess of $500,000 with equipment.

Municipal Government, Poznan (Posen), Poland, has arranged financing in an amount of about $1,000,000, fund to be used for construction of municipal electric light and power plant, for which plans will soon be drawn. It is scheduled for completion next year. Gilbert Redfern, American assistant trade commissioner, Warsaw, Poland, has information.

A company is being organized by Abelardo Rodriguez, La Paz, Mexico (Lower California), Gevernor of northern district of Lower California, to take over and expand Moni Works, a division of Aeronautic Construction Department, Ministry of War, Mexico City, with plant to be operated in future under private ownership. New company will be capitalized at $1,500,000 and purposes development of works to include motor construction, as

A Giant Electric Telpher at the Leipzig Trade Fair



ONE of the conspicuous exhibits in the technical division of the Leipzig Trade Fair, Leipzig, Germany, this year was a giant electric telpher in actual operation. It formed one of numerous outdoor exhibits of machinery. The track took roughly the form of a long ellipse, to illustrate the transporting of goods on straightways and around curves. The fall exposition, according to the Leipzig Trade Fair, Inc., New York, will be held from Aug. 26 to Sept. 1

well as general aircraft parts and assembling divisions.

Company at Ravensbourne, Dunedin, New Zealand, plans early construction of a new mill for manufacture of superphosphates, to cost close to $1,000,000 with equipment. Julian B. Foster, American trade commissioner, Wellington, New Zealand, has information.

Plans are under way by Liverpool Corporation, Liverpool, England, for new steam-operated electric power plant at River Mersey Docks of Docks Board, for which negotiations are under way for purchase. Plant will have initial capacity of 100,000 kw., and ultimate output of 400,000 kw., divided into 50,000 kw. units. It is estimated to cost about $7,500,000 and will be built in cooperation with Central Electricity Board of British Electricity Commission, London, which will purchase practically entire output.

Fox Brothers International Corporation, 33 Rector Street, New York, has secured contract from Compania Transerea Espagnola, Seville, Spain, for the construction of a local airport for a Zeppelin line to be operated from such point to Buenos Aires, Argentina. It will include hangars, repair and construction shops, terminal buildings and other structures, with estimated cost of $5,000,000.

Colon Oil Corporation, care of Lee, Higginson & Co., 43 Exchange Place, New York, bankers, recently formed under Delaware laws by Royal Dutch-Shell Oil Syndicate and Carib Syndicate, Ltd., London, England, will take over and expand Colon Development Co., Ltd., operating oil properties in Maracaibo Basin, Venezuela. New company is disposing of bond issue of $10,000,000 in United States, proceeds to be used primarily for construction of new pipe line, drilling of additional wells and installation of equipment. Gen. Avery D. Andrews is president, with headquarters at 65 Broadway, New York.

A machinery and engineering works at Chelmsford, England, has plans under way for an addition to cost close to $500,000 with equipment. Information at office of Bureau of Domestic and Foreign Commerce, Washington, reference England No. 68676; also London, William L. Cooper, American commercial attaché.

New Trade Publications

Ball Bearings.—McGill Metal Co., Valparaiso, Ind. loose leaf catalog of 40 pages, 8½ x 11 in., describing Schubert ball bearings of radial, angular contact and thrust types. A feature of these bearings is that they are equipped with bronze retainers. Comprehensive load capacity tables are included and data are given on magneto type bearings and extra light and narrow type bearings. Information relating to mounting and to lubrication is included and pages are devoted to the properties and some of the uses of McGill metal, a special aluminum bronze.

Pipe Threading and Cutting Machinery.—Landis Machine Co., Waynesboro, Pa. Catalog No. 31, 64 pages, 6 x 9 in. In addition descriptive material and specifications of pipe threading and cutting machines which range in size from 2 to 20 in. and are arranged for either belt or motor drive, data are given on single and double-head pipe and nipple threading machines, and on various sizes of the Geist roller pipe cutter. The Landis chaser, chaser holder and stationary pipe die heads are illustrated and described at length, as well as the company's standard, internally tripped and Lanco pipe and nipple threading die heads. Useful information includes a table of Briggs and Whitworth standard pipe threads and a table of cutting speeds for pipe.

Lubricating Systems.—Madison-Kipp Corporation, Madison, Wis. Booklet of 56 pages, 10 x 14 in., of reprints of recent advertisements of the company's fresh oil lubricating system. A large number of applications to oil, gas and steam engines is illustrated and briefly described, as well as use of the lubricators on turret lathes, chucking machines, planers, punch presses, steam hammers, woodworking and other machinery. Several pages are devoted to general and special data relating to the construction of the lubricators.

Die Cushions for Power Presses.—Marquette Tool & Mfg. Co., 1900 North Kilbourn Avenue, Chicago. Catalog No. 4, 151 pages, 6½ x 9½ in., bound in boards. More than 20 types of pneumatic die cushions, designed for use in connection with presses of various types and for a variety of work, are described and illustrated. Specifications and lists of parts are given for each type, and actual installations and samples of work are pictured. Pneumatic toggle links, pressure control and other pneumatic devices are also described, and a section is devoted to the company's hydropneumatic die cushions. Constructional sketches of various types of dies, showing the application of the pneumatic cushions are reproduced, and several pages are devoted to useful information. The latter includes weight tables, data relating to the width of strips for staggered cuts, areas of drawn shells, blank diameters, pressures required for punching and shearing steel and brass plate, and the approximate clearance between the punch and die on the diameter.

Shovels, Cranes and Drag Lines.—Northwest Engineering Co., 28 East Jackson Boulevard, Chicago. A 40-page catalog describing machines made by this company, and giving details of features of design. It is well illustrated with operation views.

Drop Pit Table. — Watson-Stillman Co., 75 West Street, New York. Bulletin C-30 of 12 pages illustrates and describes an electric drop pit table for railroad shops and similar uses, operated through the medium of four screws. This is designed to take certain parts from under a locomotive or car and remove them for repair or replacement. The equipment is made with capacity up to 50 tons.

Multi-Stage Centrifugal Pumps.—Ingersoll-Rand Co., 11 Broadway, New York. Bulletin 7158 of 32 pages describes the Cameron type of multi-stage centrifugal pumps and gives a large number of installation views. There are also several sections and detail views, showing parts of the pump and describing its construction.

Artificial Daylight.—O. C. White Co., 15 Hermon Street, Worcester. Bulletin of eight pages describing electric light reflector with a lens designed to change yellow light into the equivalent of daylight. These are made in a wide variety of forms, with standards, etc., for various applications.

Bearings.—Sumet Corporation, 1547 Fillmore Avenue, Buffalo. Folder devoted to bronze bearings, particularly for use in overhead electric traveling cranes.

Spraying Air Brush. — Paasche Air Brush Co., 1927 Diversey Parkway, Chicago. Folder illustrating and describing spray painting units, including both the air brush of pistol form and a gasoline or electric-driven unit to supply the pressure. It is portable and may be used indoors or outdoors as needed.

Ball Bearings for Machine Tools.—New Departure Mfg. Co., Bristol, Conn. Booklet of 20 pages illustrating and describing various types of ball bearings for machine tool use, including those on pulleys, change-speed gear boxes, worm gear reducers, bevel gears, spindles, both horizontal and vertical, etc. Methods of lubrication are shown.

Markets for American Industrial Machinery

The United States exported more than $183,000,000 worth of strictly industrial machinery in 1927, a gain of approximately one-fifth over the previous year, and representing a volume greater than at any time since the post-war expansion of 1921, according to S. R. March, Industrial Machinery Division, Department of Commerce, Washington.

Canada, the United Kingdom and Mexico continued to be the largest markets for American machinery, in the order named. Cuba was the fourth best customer of the United States, but in spite of large purchases of sugar mill machinery the trade volume of 1924 and 1925 has not as yet been regained. The Venezuelan market for industrial machinery exports of the United States has steadily increased. Exports to Germany have grown in six years to more than ten times the $566,000 volume of 1922. Shipments to Soviet Russia in Europe have increased from $64,000 in 1922 to ten times that amount in 1927. Exports to both Argentina and Brazil reached the largest volume in six years.

Shipments to Chile declined sharply from the peak total of 1926, but nevertheless remained in excess of any other year since 1922. In view of the prolonged political and military disturbances in China, trade with that country naturally declined.

Germany to Trade Machinery for Tobacco

HAMBURG, GERMANY, June 23.—A contract has been signed by the Bulgarian Government and the Association of Agricultural Machinery Manufacturers in Germany, under which Bulgaria will receive $1,100,000 worth of agricultural machinery in exchange for tobacco of the same value.